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<u>L6</u>	L5 not l4	1	<u>L6</u>
<u>L5</u>	l2 same l3	3	<u>L5</u>
<u>L4</u>	l1 and l2 and L3	4	<u>L4</u>
<u>L3</u>	structured with (surfactant\$1 or (surface active))	449	<u>L3</u>
<u>L2</u>	alkylglycoside\$1 or alkylglucoside\$1	1029	<u>L2</u>
<u>L1</u>	glyphosate OR (roundup or spasor or muster or glifonox or glycel) OR (phosphonomethylglycine or ((phosphonomethyl or (phosphono methyl)) glycine))	5678	<u>L1</u>

END OF SEARCH HISTORY

WEST[Generate Collection](#)[Print](#)**Search Results - Record(s) 1 through 4 of 4 returned.**☒ 1. Document ID: US 6180566 B1

L4: Entry 1 of 4

File: USPT

Jan 30, 2001

US-PAT-NO: 6180566

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: January 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.1; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206; 504/363

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RMC
Draw Desc	Image										

☒ 2. Document ID: US 6117820 A

L4: Entry 2 of 4

File: USPT

Sep 12, 2000

US-PAT-NO: 6117820

DOCUMENT-IDENTIFIER: US 6117820 A

TITLE: Agrochemical formulation

DATE-ISSUED: September 12, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Cutler; Julia Lynne	Bracknell			GB
Bean; Michael John	Bracknell			GB

US-CL-CURRENT: 504/206; 504/222, 504/250, 504/333, 504/362, 514/975

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RMC
Draw Desc	Image										

☒ 3. Document ID: US 5795847 A

L4: Entry 3 of 4

File: USPT

Aug 18, 1998

US-PAT-NO: 5795847

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

DATE-ISSUED: August 18, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nielsen; Erik	Greve			DK
Oxb.o slashed.l; Arne	R.o slashed.dovre			DK

US-CL-CURRENT: 504/206

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMIC
Draw Desc	Image										

☒ 4. Document ID: WO 9909822 A1

L4: Entry 4 of 4

File: EPAB

Mar 4, 1999

PUB-NO: WO009909822A1

DOCUMENT-IDENTIFIER: WO 9909822 A1

TITLE: AGROCHEMICAL FORMULATION

PUBN-DATE: March 4, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
BEAN, MICHAEL JOHN	GB
CUTLER, JULIA LYNNE	GB

INT-CL (IPC): A01 N 25/30

EUR-CL (EPC): A01N025/30; A01N057/20

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KMIC
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L4: Entry 1 of 4

File: USPT

Jan 30, 2001

DOCUMENT-IDENTIFIER: US 6180566 B1

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

Abstract Text (1):

Stable, concentrated herbicide preparation comprising at least one herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group suspended in finegrained form in a liquid phase, and at least 5% a by weight of a dissolved electrolyte; a process for producing said herbicide preparation and an activating additive (adjuvant) for combination with said herbicide preparation. Preferred suspensions comprise the herbicides glyphosate and glufosinate and the electrolyte ammonium sulphate, acting synergistically. It has not hitherto been possible to incorporate high concentrations of synergistic electrolytes in liquid concentrates of said herbicides.

Brief Summary Text (3):

In published european patent application EP 388.239 A1 pesticide suspensions are described, in which a certain amount of electrolytes is desirable. The suspension of finely ground pesticides in a concentration from 10-70% by weight in aqueous, structured systems of surfactants is described. The following pesticides are mentioned explicitly: ethofumesate, phenmedipham, dazomet, mancozeb, methylene bithiocyanate, amitraz and triforine. None of these pesticides contains both an acid and an amino group. The wording "structured systems of surfactants" is intended to mean aqueous systems, in which the surfactants form mesophases comprising structures larger than conventional spherical micelles and mutually interacting to form thixotropy in the aqueous medium. The structure comprises multilayers of spherulites or lamellae dispersed or emulsified as rods or discs in an outer aqueous phase, the size being normally 0.5-20 .mu.m. In the 14 examples of the application the not surface active electrolytes are present in an amount of 1.2-6.4% by weight of the total composition. It is a characteristic feature of this system, that the surfactant and the electrolyte must be adapted to each other as regards composition and amount to obtain the desired, stable structure.

Brief Summary Text (6):

It is well known that ammonium sulphate acts synergistically on the biological effect of glyphosate and glufosinate. For instance the patent literature contains many examples of combinations of glyphosate and ammonium sulphate, and in practice the farmer usually adds supplementary ammonium sulphate when diluting the glyphosate for use.

Brief Summary Text (7):

Danish patent application no. 2348/88 describe liquid, aqueous solutions of glyphosate with ethoxylated monoamines as surfactants. The possibility of dissolving additional ammonium sulphate exists, but this will lead to a lowering of the dissolvable quantity of glyphosate. Therefore, the maximum amount of glyphosate in a solution containing 280 g/l ammonium sulphate is approximately 120 g/l.

Brief Summary Text (8):

UK patent application GB 2.233.229 A describes a similar system, the ethoxylated monoamines being replaced by ethoxylated diamines. The typical, aqueous solutions contain 200 g/l ammonium sulphate and 75 g/l of glyphosate as its isopropylammonium salt.

Brief Summary Text (9):

UK patent application GB 2.245.170 A claims solutions of glyphosate containing ethoxylated phosphate esters as surfactants. In the examples, where ammonium sulphate has been added supplementary to the formulation in amounts of 200-300 g/l, the glyphosate constitutes 75 g/l corresponding to 100 g/l of the isopropylammonium salt.

Brief Summary Text (10):

In European patent application EP 441.764 A1 is mentioned, that alkoxyated, quaternary ammonium compounds especially coethoxylated-propoxylated quaternary ammonium compounds, is environmentally more acceptable and less skin and eye irritating than ethoxylated fatty amines. It is stated, that aqueous solutions of glyphosate in combinations with said surfactants also can contain ammonium sulphate, but no examples with such formulations are given. On the other hand two solid compositions containing ammonium sulphate are described.

Brief Summary Text (11):

In European patent application EP 498.785 A1 glyphosate formulations are mentioned, which contain esters of sorbitol and fatty acids as surfactants in combination with another surfactant. It is mentioned, that these formulations whether aqueous solutions or solid, finely distributed formulations may also contain ammonium sulphate or other inorganic ammonium salts. The system, however, seems to be best suited for solid formulations.

Brief Summary Text (12):

European patent application EP 498.145 A1 describes solid compositions containing glyphosate as free acid or salt, an inorganic ammonium salt (preferably ammonium sulphate) and alkyl-glycoside or alkylpolyglycoside as surfactant.

Brief Summary Text (13):

European patent application EP 448.538 A1 describes combinations of glyphosate and oxyfluorfen in solid formulations, additionally containing ammonium sulphate and other inorganic compounds.

Brief Summary Text (14):

International patent application WO 92/12637 deals with solid, preferably extruded or granulated formulations containing glyphosate in combination with alkaline compounds. A reaction takes place between the glyphosate and the alkaline compound either during the production process or during the subsequent mixing with the diluent water to totally or partly neutralize the glyphosate as salt whereby it dissolves easier and more quickly. The formulations shown besides comprise surfactants and frequently ammonium sulphate.

Brief Summary Text (15):

In danish patent application no. 6490/89 solid formulations of glyphosate in acid form containing a saturated C.sub.16-18 -fatty alcohol, being ethoxylated with approximately 25 moles ethyleneoxide are described. The formulations may additionally contain supplementary ammonium sulphate.

Brief Summary Text (17):

European patent application 243.872 A1 discloses pesticide preparations, comprising inter alia glyphosate dispersed in an oil containing, liquid phase. The addition to the formulations of ammonium sulphate is not mentioned.

Brief Summary Text (18):

French patent application 2.661.315 discloses the suspension of glyphosate and derivatives thereof in an organic solvent. The organic solvent might be water miscible, and it is mentioned that up to 50% of the solvent may be replaced by water. Furthermore the composition may comprise ammonium sulphate, which is characterized as an adjuvant. The form of the ammonium sulphate of the composition is not apparent from the description, but in the 5 examples of the application, the ammonium sulphate together with the glyphosate compound seems to be totally suspended or dissolved only to a limited extent in the liquid phase.

Brief Summary Text (19):

International patent application WO 92/21686 describes the production of trimethylsulfonium salt of glyphosate for instance by the reaction of glyphosate trimethylsulfonium hydrogen sulphate with an alkaline compound like ammonia. The application does not mention herbicidal suspensions in relation to the present invention. No description is found, neither in the patent description nor in the examples, of significant amounts of glyphosate being at any time suspended in an electrolyte solution and certainly not in a stable form. The principles of the present invention for formulating glyphosate, seem never to have been considered.

Brief Summary Text (20):

Many of the examples shown demonstrate the desirability of combining the herbicides glyphosate or glufosinate with ammonium sulphate and selected surfactants in one and the same formulation. Advantageously the formulation is as concentrated as possible.

Brief Summary Text (21):

As far as liquid, dissolved formulations are concerned, the ammonium sulphate has a salting-out effect on the dissolved salts of glyphosate and glufosinate, as well as on the dissolved surfactants, and an upper limit exists of the concentration of the solution dependent on the actual surfactant. Environmental requirements on the detergents, for instance as to biodegradability, poor toxicity towards fishes and low skin and eye irritation may reduce still further the number of relevant wetting agents. Besides, the various surfactants differ significantly in their promotion of the biological effect of glyphosate and glufosinate.

Brief Summary Text (22):

Therefore, the trend in recent developments is towards solid, finely dispersed and non-dusty formulations. Although the solubility of ammonium sulphate in water is big, the speed of dissolution of ordinary, commercial, crystalline ammonium sulphate in water in practice is hardly acceptable. Consequently, the crystalline ammonium sulphate frequently needs to be grinded before being mixed with glyphosate or glufosinate or preferably a salt thereof, the selected surfactant(s) and additive(s) being subsequently added. Amongst the additives adhesives, absorbing fillers or anticaking agents should be mentioned, which are necessary to obtain a finely dispersed, non-caking and easily flowing, solid formulation of adequate storage stability. For these processes an expensive formulation equipment is necessary.

Brief Summary Text (33):

Herbicides with at least one primary, secondary and/or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group normally have a relatively high solubility in water: about 0.1 corresponding to 1000 ppm or more, preferably at least 0.4% corresponding to 4000 ppm; by way of example the solubility of glyphosate is approximately 1% by weight in pure water at 20.degree. C.

Brief Summary Text (36):

The fact, that the grinding can take place without viscosity problems, even when no surfactant is added, is probably an essential condition for realising the invention. Even if a surfactant were added, the salting out from the electrolyte of the compound would generally be so extensive, that the wetting effect of the insignificant amount still dissolved in the water phase would be too small to influence significantly on the grinding. The surfactant, however, is still desirable. As mentioned above said surfactant is necessary to ensure the optimum, biological effect of the formulation, and it might contribute to the stabilization of the final formulation, i.e. ensure that the formulation remains homogenous and does not separate. Apparently the finely grinded suspended herbicide and the added, finely distributed surfactant mutually interact to produce a mixture of an advantageous pseudoplastic or thixotropic character. Accordingly, it is possible to produce stable formulations comprising as the sole components water with dissolved electrolyte, suspended glyphosate and surfactant. It is even possible to produce stable suspensions using no surfactants at all.

Brief Summary Text (43):

d) In suspension preparations the amount of suspended solid material in a liquid

phase must be below a certain upper limit. Normally the practical limit is about 500 g/l suspension. In glyphosate preparations containing ammonium sulphate the desired content of ammonium sulphate as well as that of glyphosate is high, and this is not possible to obtain if both compounds are to be suspended. When the ammonium sulphate is dissolved in the water phase and the glyphosate only is dispersed herein, it is possible to increase the amounts of ammonium sulphate as well as glyphosate.

Brief Summary Text (51):

Specially preferred herbicides are glyphosate (N-(phosphonomethyl)-glycine), glufosinate (4-(hydroxy(methyl)phosphinoyl)-DL-homoalanine), bilanafos (4-hydroxy(methyl)phosphinoyl)-L-homoalanyl-L-alanyl-L-alanine and/or glyphosine (N,N-bis(p-hosphonomethyl)glycine), compare claim 4.

Brief Summary Text (58):

The invention also relates to stable, activating additives (adjuvants) on concentrated form, said adjuvants being active when admixed with glyphosate- and/or glufosinate preparations for combatting weeds, and said additives comprising at least one surfactant in an amount of 4-58% by weight, said surfactant being emulsified, suspended and/or dissolved in a liquid, aqueous phase; the composition of the adjuvant being further characterized by comprising at least one undissolved, fine-grained, not biologically active viscosity regulating filler acting to prevent separation of the surfactant, said viscosity regulating filler comprised in an amount of min. 0.3% by weight, and said liquid, aqueous phase being characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of min. 5%, compare claim 19.

Brief Summary Text (59):

Such a stable, activating additive is in a way an intermediate for the production of a concentrated suspension of glyphosate and/or glufosinate according to the invention, since the herbicide suspension can be produced from the additive simply by admixing finely grinded herbicide.

Brief Summary Text (60):

To produce the herbicidal solution/suspension for use, the farmer may make use of the additive, too. He just has to mix it with a glyphosate- or a glufosinate preparation. The form of the herbicide is of minor importance in this connection, for instance a finely grinded powder, a solid granulate, a solution in an appropriate solvent or even a suspension may be used.

Brief Summary Text (72):

Preferred herbicidal compositions are such, in which the selected herbicide is glyphosate or glufosinate, and the selected electrolyte is ammonium sulphate.

Brief Summary Text (82):

Specially preferred non-ionic surfactants are alkylglycosides, alkylpolyglycosides, alkoxyated alkylglycosides, alkoxyated alkylpolyglycosides, alkoxyated saccharides, alkoxyated polysaccharides, alkoxyated acetylene diols containing a symmetrically substituted triple bond and ethoxyated polymethylsiloxanes, compare claim 13.

Brief Summary Text (89):

It is possible to adjust the suspension to enable most surfactants to physically enter it. The suspended herbicide helps preventing the surfactant from separating out. The surfactant is generally present in the suspension in a non-structured form. Therefore in most of the described herbicide suspensions comprising a surfactant, the surfactant will separate as an independent, liquid phase or as solid particles in case the suspended herbicide and solid additives, if any, are removed from the suspensions.

Brief Summary Text (90):

The present invention does not relate to the final dilutions made at the user level. The invention relates to concentrates only, being herbicide preparations or activating additives, which according to the invention are formulated in a new and more advantageous way. Since dilutions of use, made from the concentrates to a certain extent are well known, because they can be obtained by separate addition of

ammonium sulphate to known products, and they are known to possess a particularly satisfying biological effect, it seems redundant to prove the effect of the described compositions. There might be differences in the pH-values of the dilutions. For instance the pH-value of the herbicide preparations according to the invention is frequently low, because the glyphosate is preferably used in its non-neutralized form, but this fact is known to be of no biological importance. Reference is made in this connection to Danish patent application 6490/89, specially dealing with glyphosate on non-neutralized form.

Brief Summary Text (107):

Specially preferred herbicide suspensions comprise glyphosate suspended in ammonium sulphate, said suspensions being produced by adding sulfuric acid to solutions of the ammonium salt of glyphosate or adding ammonia to a solution of the sulfuric acid salt of glyphosate, preferably while cooling and continuously stirring.

Brief Summary Text (112):

The amount of the herbicide, for instance glyphosate or glufosinate, constitutes 0.2-4 kg/ha, preferably 0.3-3 kg/ha, especially 0.5-2.2 kg/ha and specially 0.8-1.5 kg/ha, calculated on an active ingredient basis.

Detailed Description Text (2):

Experiments 1-5 (see table A) demonstrates the suspension of glyphosate in free, non-neutralized form in an aqueous solution of ammonium sulphate. Calculated on the aqueous solution the amount of ammonium sulphate is 40% in all 5 experiments corresponding to a saturation in water at approximately 0.degree. C. In all of the examples, ethoxylated fatty amines are used as surfactants.

Detailed Description Text (3):

For the manufacture of the compositions 1 and 2 the Genamine (the ethoxylated fatty amine) was initially dissolved in a part of the water, following which the pH was adjusted with concentrated sulfuric acid to pH=3.5. The rest of the water was then added and subsequently the ammonium sulphate was stirred in, leading to the precipitation of the chief of the Genamine. The mixture was transferred as quantitatively as possible to a mini-mill with a volume of maximally 50 ml from the company Eiger Engineering Ltd., Warrington, Cheshire, England, being filled with 1-2 mm zirconium oxide pearls. The mill was started immediately at its highest speed, and the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Attagel was added, and the grinding was continued for maximally 5 minutes.

Detailed Description Text (4):

For the manufacture of the compositions 3, 4 and 5, the ammonium sulphate was initially dissolved in the total amount of water, following which the concentrated sulfuric acid was added, and the solution was transferred to the mini-mill. The mill was started at its highest speed, following which the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Genamin was added immediately followed by Attagel, and the grinding was continued for approximately 5 minutes.

Detailed Description Text (6):

Samples of the above compositions were stored in 100 ml glass bottles with screw caps for 1 to approximately 4 weeks before the beginning of the accelerated testing. It was initially evaluated, whether the sample had separated a clear aqueous phase, and whether the surfactant had separated out on its own. The results of all evaluations are listed in table A. Subsequently the sample was shaken. The viscosity was visually evaluated, and the average particle size of the grinded glyphosate particles was estimated microscopically at 256.times.. (It is very difficult to use a particle sizer for so many samples, because the samples must be measured in concentrated salt solutions possibly further saturated with glyphosate, in order to ensure, that the samples are not dissolved in the water. It is also important that the concentrated salt solution does not contain undissolved impurities, which might disturb the measurements). It was also estimated, whether the added surfactants had separated out as oily drops. If so, the estimated size of the drops was noted. If no oily drops could be observed, a "n.d." (not detected) is stated in the table. It should be noted, that any microscopic airbubbles present may give rise to a false

Detailed Description Text (18):

Detailed Description Text (24):

Detailed Description Text (30):

Detailed Description Text (35):

Detailed Description Text (52):

Detailed Description Text (54):

Detailed Description Text (58):

A preferred composition of glyphosate in electrolyte solution comprises the

following:

Detailed Description Text (59):

169.1 g glyphosate

Detailed Description Text (64):

169.1 g glyphosate is dissolved in 266 g water and 80 g aqueous 25% w/w ammonia solution together with 159.4 g ammonium sulphate in a beaker and is transferred to another container under vigorous stirring.

Detailed Description Paragraph Table (2):

TABLE A Experiment no. 1 2 3 4 5 Component Composition in % Deionized 41.6 41.1 41.0 41.0 40.8 water Ammonium 27.8 27.4 27.4 27.4 27.2 sulphate Glyphosate, 20.8 20.6 20.6 20.6 20.4 98% Genamin T 6.9 6.8 150 (1) Genamin O 6.8 80 (2) Genamin C 6.8 100 (3) Genamin C 6.8 020 (4) Sulfuric app. 1.5 app. 1.4 2.1 2.1 2.7 acid, 98% Attagel (5) 1.4 2.7 2.1 2.1 2.1 Total weight 144 146 146 146 147 (g) Density 1.30 1.29 1.28 1.28 1.25 (g/ml) Glyphosate 270 266 264 264 255 (g/l) Ammonium 361 353 351 351 340 sulphate (g/l) Evaluation before storage Appearance 15% upp. 10% upp. 10% upp. 10% upp. 10% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly slightly pseudo- pseudo- plastic viscous viscous plastic plastic Particle app. 10 app. 10 5-10 app. 10 5-10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Evaluation after storage at various temperatures Appearance 30% upp. 20% upp. 15% upp. 25% upp. 25% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily suffi- suffi- easily easily Particle app. 10 10-15 app. 10 10-15 5-10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 4 6 3 3 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance 15% upp. 5% upp. 10% upp. 10% inner 15% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly pseudo- pseudo- pseudo- plastic viscous plastic plastic plastic Particle app. 10 10-15 app. 10 10-15 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 4 4 2 7 dissol. (s)

Detailed Description Paragraph Table (3):

TABLE B Experiment no. 6 7 8 9 10 Component Composition in % Deionized 40.5 40.5 40.5 40.5 40.5 water Ammonium 27.0 27.0 27.0 27.0 27.0 sulphate Glyphosate, 20.3 20.3 20.3 20.3 98% Ethoquad 10.2 C/25 (6) Emcol CC 10.2 55 (7) Ampholyt 10.2 SKKP-70 (8) Synperonic 10.2 NP-10 (9) Tween 20 10.2 (10) Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight 148 148 148 148 148 (g) Density 1.28 1.27 1.27 1.27 1.27 (g/ml) Glyphosate 260 258 258 258 258 (g/l) Ammonium 346 343 343 343 343 sulphate (g/l) Evaluation before storage Appearance no se- no se- 15% lower 15% lower 10% lower paration paration cl. phase cl. phase cl. phase Viscosity slightly easily slightly slightly slightly viscous viscous viscous viscous Particle app. 10 app. 10 10-15 10-15 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. 25-100 (.mu.m) Evaluation after storage at various temperatures Appearance 20% upp. 30% upp. no se- 20% upp. 15% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily easily passende passende passende viscous viscous viscous Particle app. 5 app. 10 app. 10 app. 10 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 2 2 3 3 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance 10% upp. 25% upp. no se- no se- 10% upp. cl. phase cl. phase paration paration cl. phase Viscosity pseudo- easily pseudo- slightly pseudo- plastic plastic viscous plastic Particle 5-10 5-10 ap. 10 10-15 10-15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 4 1 3 7 2 dissol. (s)

Detailed Description Paragraph Table (4):

TABLE C Experiment no. 11 12 13 14 15 Component Composition in % Deionized 40.5 40.5 40.5 40.5 40.5 water Ammonium 27.0 27.0 27.0 27.0 27.0 sulphate Glyphosate, 20.3 20.3 20.3 20.3 98% Plantaren 10.2 225 (11) Plantaren 10.2 600 CS (12) Berol 02 10.2 (13) Berol 922 10.2 (14) Pleuriol 10.2 PE6400 (15) Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight 148 148 148 148 148 (g) Density 1.28 1.28 1.28 1.27 1.28 (g/ml) Glyphosate 260 260 260 258 260 (g/l) Amm. 346 346 346 343 346 sulphate (g/l) Evaluation before storage Appearance foaming 15% lower no se- no se- 15% upp. 10% lower cl. phase paration paration cl. phase cl. phase Viscosity pseudo- suffi- clearly pseudo- pseudo- plastic ently pseudo- plastic plastic plastic Particle 10-15 app. 10 app. 10 app. 15 app. 15 size (.mu.m) Oil drops n.d. n.d. <25 25-100 >100 (.mu.m) Evaluation after storage at various temperatures Appearance 5% inner 20% upp. 10% upp. 15% upp. 30% upp. cl. phase cl. phase cl. phase cl. phase cl. phase

Viscosity suffici- suffici- suffici- easily easily ently ently ently Particle 10-15
 10-15 5-10 app. 15 app. 15 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m)
 Speed of 46 12 2 6 2 dissol. (s) Evaluation after storage 14 days at 55.degree. C.
 Appearance no se- 20% upp. no se- no se- no se- paration cl. phase paration paration
 paration Viscosity pseudo- suffici- viscous* pseudo- pseudo- plastic ently plastic
 plastic Particle 10-15 10-15 5-10 app. 15 app. 15 size (.mu.m) Oil drops n.d. n.d.
 n.d. n.d. n.d. (.mu.m) Speed of 25 14 23 6 4 dissol. (s) *screw cap leaky, crystals
 from the liquid observed.

Detailed Description Paragraph Table (5):

TABLE D Experiment no. 16 17 18 19 20 Component Composition in % Deionized 40.5 40.8
 40.8 40.5 40.5 water Ammonium 27.0 27.2 27.2 27.0 27.0 sulphate Glyphosate, 20.3
 20.4 20.4 20.3 20.3 98% Ethoquad 10.2 C/25 (6) Arkopon T 10.2 hockonc. (17) Berol
 987 10.2 (18) Surfadon LP 10.2 300 (19) Aerosil R 1.4 972 (20) Attagel (5) 2.0 1.4
 2.0 2.0 Total weight 148 147 147 148 148 (g) Density 1.26 1.26 1.26 1.27 1.26 (g/ml)
Glyphosate 256 257 261 258 256 (g/l) Amm. 340 343 348 343 340 sulphate (g/l)
 Evaluation before storage Appearance no se- no se- 10% lower no se- no se- paration
 paration cl. phase paration paration Viscosity slightly pseudo- pseudo- pseudo-
 pseudo- viscous plastic plastic plastic plastic Particle app. 10 10-15 app. 10 app.
 10 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d. <25 n.d. (.mu.m) Speed of 25-100
 25-100 n.d. 25-100 <25 dissol. (s) Evaluation after storage at various temperatures
 Appearance 10% upp. 30% upp. 15% lower no se- no se- cl. phase cl. phase cl. phase
 paration paration Viscosity suffici- pseudo- pseudo- pseudo- pseudo- ently plastic
 plastic plastic plastic Particle 5-10 app. 10 app. 10 app. 10 size (.mu.m)
 Oil drops n.d. n.d. n.d. <25 n.d. (.mu.m) Speed of 3 3 14 2 13 dissol. (s) Evaluation
 after storage 14 days at 55.degree. C. Appearance no se- 10% upp. no se- no se- no
 se- paration cl. phase paration paration paration Viscosity slightly pseudo-
 slightly pseudo- some viscous plastic viscous plastic viscous Particle 5-10 10-15
 5-10 10-15 5-10 size (.mu.m) Oil drops n.d. n.d. n.d. 25-100 n.d. (.mu.m) Speed of 5
 2 19 4 20 dissol. (s)

Detailed Description Paragraph Table (6):

TABLE E Experiment no. 21 22 23 24 25 Component Composition in % Deionized 40.5 41.4
 40.0 38.7 38.2 water Ammonium 27.0 27.6 26.7 25.8 25.5 sulphate Glyphosate, 20.3
 20.7 20.0 19.4 19.1 98% Berol OX 10.2 10.3 13.3 16.1 15.9 45-11 (21) Attagel (5) 2.0
 1.3 Total weight 148 145 150 155 157 (g) Density 1.26 1.26 1.26 1.25 1.25 (g/ml)
Glyphosate 256 261 252 243 239 (g/l) Ammonium 340 348 337 323 319 sulphate (g/l)
 Evaluation before storage Appearance no se- 15% lower 15% lower 15% lower 10% lower
 paration cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- easily easily
 easily slightly plastic viscous Particle app. 15 10-15 app. 15 10-15 app. 10 size
 (.mu.m) Oil drops <25 25-100 <25 25-100 25-100 (.mu.m) Evaluation after storage at
 various temperatures Appearance 5% upp. 35% upp. 30% inner 20% lower 5% inner cl.
 phase cl. phase cl. phase cl. phase cl. phase Viscosity clearly very ea- easily
 suffici- pseudo- pseudo- sily ently plastic plastic Particle 10-15 10-15 10-15 10-15
 app. 10 size (.mu.m) Oil drops <25 n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 2 2 2 3
 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance no se- 30%
 upp. 15% inner 15% lower 10% lower paration cl. phase cl. phase cl. phase cl. phase
 Viscosity clearly very ea- easily suffici- pseudo- pseudo- sily ently plastic
 plastic Particle 10-15 10-15 app. 15 10-15 10-15 size (.mu.m) Oil drops <25 n.d.
 25-100 n.d. 25-100 (.mu.m) Speed of 10 1 1 2 3 dissol. (s)

Detailed Description Paragraph Table (7):

TABLE F Experiment no 26 27 28 29 30 Component Composition in % Deionized water 40.8
 40.5 40.9 47.2 40.5 Ammonium sulphate 27.2 27.0 27.3 20.3 27.0 Glyphosate, 98% 20.4
 20.3 20.5 20.3 20.3 Marlupal 1618/25 (22) 10.2 Radiasurf 7417 (23) 10.2 Berol OX
 45-11 (21) 10.3 10.2 Berol 533 (24) 10.2 Aerosil R 972 (20) 1.0 Attagel (5) 1.4 2.0
 2.0 2.1 Total weight (g) 147 148 146.5 148 148 Density (g/ml) 1.27 1.28 1.26 1.22
 1.26 Glyphosate (g/l) 345 346 258 248 256 Ammonium sulphate 259 260 344 248 340
 (g/l) Evaluation before storage Appearance no separation no separation no separation
 no separation no separation Viscosity slightly slightly pseudo- pseudo- pseudo-
 viscous viscous plastic plastic plastic Particle size (.mu.m) app. 15 app. 15 app.
 10 app. 15 app. 15 Oil drops (.mu.m) n.d. 25-100 25-100 25-100 <25 Evaluation after
 storage at various temperatures Appearance 10% upp. 15% upp. 30% upp. 30% upp. 15%
 upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity clearly pseudo-
 pseudo- pseudo- suffici- pseudo- plastic plastic plastic ently plastic Particle size

(.mu.m) 10-15 app. 10 app. 10 10-15 app. 10 Oil drops (.mu.m) n.d. n.d. 25-100 n.d.
 n.d. Speed of dissol. (s) 2 2 2 2 3 Evaluation after storage 14 days at 55.degree.
 C. Appearance no separation no separation no separation 20% upp. no separation cl.
 phase Viscosity slightly pseudo- pseudo- easily viscous* viscous plastic plastic
 Particle size (.mu.m) 10-15 app. 10 app. 10 app. 15 app. 10 Oil drops (.mu.m) n.d.
 n.d. n.d. n.d. n.d. Speed of dissol. (s) 7 3 2 2 17 *Screw cap leaky, crystals from
 the liquid observed.

Detailed Description Paragraph Table (8):

TABLE G Experiment no. 31 32 33 34 35 Component Composition in % Deionized 27.4 34.0
 40.5 36.9 33.1 water Ammonium 41.1 17.0 sulfamate Ammonium 17.0 24.6 22.1 sulphate
 Ammonium 27.0 nitrate Glyphosate, 20.5 20.4 20.3 38.5 44.8 98% Berol OX 10.3 10.2
 10.2 45-11 (21) Attagel (5) 0.7 1.4 2.0 Total weight 146 147 148 130 145 (g) Density
 1.35 1.29 1.25 1.33 1.38 (g/ml) Glyphosate 277 263 254 512 618 (g/l) Electrolyte 555
 439 338 327 305 (g/l) Evaluation before storage Appearance 10% lower no se- no se-
 20% upp. 10% upp. cl. phase paration paration cl. phase cl. phase Viscosity easily
 slightly easily passende slightly viscous viscous viscous Particle app. 15 10-15
 10-15 20-25 app. 20 size (.mu.m) Oil drops 20-100 25-100 25-100 n.d. n.d. (.mu.m)
 Evaluation after storage at various temperatures Appearance 25% lower 10% upp. 30%
 upp. 30% upp. 20% upp. cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity
 easily pseudo- easily passende slightly plastic viscous viscous Particle app. 15
 10-15 10-15 25-30 app. 20 size (.mu.m) Oil drops <25 n.d. n.d. n.d. n.d. (.mu.m)
 Speed of 2 3 2 32 12 dissol. (s) Evaluation after storage 14 days at 55.degree. C.
 Appearance 15% lower no se- 30% upp. 30% upp. 15% upp. cl. phase paration cl. phase
 cl. phase cl. phase Viscosity easily pseudo- easily easily slightly plastic viscous
 Particle app. 15 10-15 app. 15 app. 25 app. 20 size (.mu.m) Oil drops n.d. n.d.
 25-100 n.d. n.d. (.mu.m) Speed of 3 5 2 16 6 dissol. (s)

Detailed Description Paragraph Table (9):

TABLE H Experiment no. 36 37 38 39 40 Component Composition in % Deionized 27.0 23.7
 37.8 27.6 26.3 water Kalium 42.1 thiocyanate Ammonium 40.5 39.5 sulphamate Natrium
 29.7 bromide Ammonium 33.8 acetate Glyphosate, 20.3 98% Glyphosate 20.3 23.0 Na-salt
Glyphosate 27.6 23.0 NH.sub.4 -salt Berol OX 10.2 9.9 10.1 9.2 45-11 (21) Marlipal
 9.9 1618/25 (22) NaOH, 28% 1.4 Attagel (5) 2.0 1.3 0.7 1.8 1.3 Total weight 148 152
 148 163 152 (g) Density 1.33 1.24 1.39 1.35 1.35 (g/ml) Glyphosate 270 285 282 373
 310 (g/l) Electrolyte 539 522 413 456 533 (g/l) Evaluation before storage Appearance
 10% lower 5% lower 10% inner no se- no se- cl. phase cl. phase cl. phase paration
 paration Viscosity pseudo- suffici- easily pseudo- clearly plastic ently plastic
 pseuplas. Particle app. 15 10-15 10-15 30-50 app. 15 size (.mu.m) Oil drops n.d. <25
 n.d. n.d. 25-100 (.mu.m) Evaluation after storage at various temperatures Appearance
 10% lower 10% lower 25% upp. no se- 10% lower cl. phase cl. phase cl. phase paration
 cl. phase Viscosity easily suffici- easily clearly clearly pseuplas. ently pseuplas.
 pseuplas. Particle 20-25 app. 15 10-15 app. 50 app. 20 size (.mu.m) Oil drops n.d.
 n.d. n.d. n.d. n.d. (.mu.m) Speed of 3 5 3 9 2 dissol. (s) Evaluation after storage
 14 days at 55.degree. C. Appearance 10% lower 10% lower 20% upp. no se- no se- cl.
 phase cl. phase cl. phase paration paration Viscosity clearly suffici- easily
 clearly clearly pseuplas. ently pseuplas. pseuplas. Particle 15-20 10-15 app. 15
 30-50 app. 15 size (.mu.m) Oil drops n.d. n.d. n.d. <25 n.d. (.mu.m) Speed of 7 8 5
 21 5 dissol. (s)

Detailed Description Paragraph Table (10):

TABLE I Experiment no. 41 42 43 44 45 Component Composition in % Deionized 38.0 38.0
 13.6 38.0 22.1 water Ammonium 20.5 32.2 sulfamate Ammonium 25.3 25.3 25.3 sulphate
Glyphosate, 19.0 19.0 20.6 19.0 25.0 98% Berol OX 9.5 9.5 10.3 9.5 45-11 (21)
 Glycerin 6.3 34.3 Propylene 20.7 glycol PEG E200 6.3 (27) Lactic acid 6.3 Attagel
 (5) 1.9 1.9 0.7 1.9 Total weight 158 158 146 158 140 (g) Density 1.27 1.25 1.30 1.27
 1.34 (g/ml) Glyphosate 241 238 268 241 335 (g/l) Elektrolit 321 316 267 321 431
 (g/l) Evaluation before storage Appearance no se- no se- no se- no se- 20% upp.
 paration paration paration partaion cl. phase Viscosity pseudo- pseudo- pseudo-
 clearly easily plastic plastic plastic pseudo- plastic Particle app. 15 app. 10 app.
 15 app. 15 app. 10 size (.mu.m) Oil drops 25-100 >100 n.d. 25-100 n.d. (.mu.m)
 Evaluation after storage at various temperatures Appearance no se- 10% upp. 10%
 lower 5% upp. 35% upp. paration cl. phase cl. phase cl. phase cl. phase Viscosity
 pseudo- pseudo- pseudo- clearly easily plastic plastic plastic pseudo- plastic
 Particle 10-15 app. 10 app. 15 app. 15 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d.

n.d. n.d. (.mu.m) Speed of 2 2 4 2 3 dissol. (s) Evaluation after storage 14 days at 55.degree. C. Appearance no se- no se- no se- no se- 25% upp. paration paration paration paration cl. phase Viscosity clearly pseudo- pseudo- clearly easily pseudo-plastic plastic pseudo- plastic plastic Particle app. 15 5-10 app. 15 app. 15 app. 10 size (.mu.m) Oil drops n.d. n.d. n.d. n.d. n.d. (.mu.m) Speed of 8 2 5 2 3 dissol. (s)

Detailed Description Paragraph Table (11):

TABLE J Experiment no. 46 47 48 49 Component Composition in % Deionized water 38.0 38.0 40.5 57.6 Ammonium sulphate 25.3 25.3 27.0 14.3 Glyphosate, 98% 19.0 19.0 30.5 25.2 Berol 02 (13) 6.3 6.3 Hydropar 19 (25) 9.5 Radia 7131 (26) 9.5 Attagel 1.9 1.9 2.0 2.9 Total weight (g) 158 158 148 139 Density (g/ml) 1.22 1.21 1.34 1.22 Glyphosate (g/l) 232 230 409 174 Ammonium sulphate 309 306 362 307 (g/l) Evaluation before storage Appearance 10% lower 15% lower no se- 10% upp. cl. phase cl. phase paration cl. phase Viscosity suffi-ci- suffi-ci- pseudo- easily ently plastic Particle size (.mu.m) app. 20 app. 15 10-15 20-25 Oil drops (.mu.m) >100 25-100 n.d. n.d. Evaluation after storage at various temperatures Appearance 30% 2 30% lower 10% upp. 10% upp. upp. cl. cl. phase cl. phase cl. phase phases Viscosity suffi-ci- pseudo- pseudo- easily ently plastic plastic Particle size (.mu.m) app. 15 10-15 10-15 20-25 Oil drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 2 2 2 22 Evaluation after storage 14 days at 55.degree. C. Appearance 15% lower 20% lower no se- no se- cl. phase cl. phase paration paration Viscosity suffi-ci- pseudo- pseudo- easily ently plastic plastic Particle size (.mu.m) app. 15 app. 15 10-15 20-25 Oil drops (.mu.m) >100 >100 n.d. n.d. Speed of dissol. (s) 4 5 2 4

Detailed Description Paragraph Table (12):

TABLE K Experiment no. 50 51 Component Composition in % Deionized water 42.8 41.7 Ammonium sulphate 28.6 27.8 Moussex 904 SE (28) 0.7 Ethoquad C/25 (6) 25.0 Berol OX 45-11 (21) 27.8 Attagel 40 (5) 3.6 2.0 Total weight (g) 140 144 Density (g/ml) 1.15 1.14 Glyphosate (g/l) -- -- Ammonium sulphate (g/l) 329 317 Evaluation before storage Appearance 10% lower 10% lower cl. phase cl. phase Viscosity sufficiently sufficiently Particle size (.mu.m) -- -- Oil drops (.mu.m) >100 25-100 Evaluation after storage at various temperature Appearance 30% lower 25% lower cl. phase cl. phase Viscosity sufficiently sufficiently Particle size (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d. Evaluation after storage 14 days at 55.degree. C. Appearance 10% lower 5% lower cl. phase cl. phase Viscosity sufficiently sufficiently Particle size (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d.

Detailed Description Paragraph Table (15):

TABLE N Experiment no. 59 60 61 62 Component Composition in g Deionized water 60.0 30.0 30.0 Ammonium sulphate 40.0 20.0 40.0 40.0 Propylene glycol 30.0 30.0 60.0 Glyphosate, 98% 30.0 30.0 30.0 30.0 Genapol OX 130 (30) 20.0 20.0 20.0 20.0 Viscosity Brook- 1800 3100 -- -- field at 20.degree. C. mPaxs mPaxs

Other Reference Publication (1):

STN International, Chemical Abstracts, vol. 119, No. 9, "Herbicide glyphosate salt concentrate", Aug. 30, 1993.

CLAIMS:

5. A composition according to claim 1, wherein the herbicide is glyphosate, glufosinate, bilanafos and/or glyphosine.

7. A composition according to claim 1, wherein the herbicide is glyphosate, glufosinate, bilanafos and/or glyphosine in its free, non-neutralized form or completely or partly converted into its respective ammonium salt by reaction with ammonia.

21. A composition according to claim 19, wherein the non-ionic surfactant is a member selected from the group consisting of an alkylglycoside, an alkylpolyglycoside, an alkoxylated alkylglycoside, an alkoxylated alkylpolyglycoside, an alkoxylated saccharide, an alkoxylated polysaccharide, an alkoxylated acetylene diol containing a symmetrically substituted triple bond or an ethoxylated polymethylsiloxane.

25. An activating additive (adjuvant) in concentrated form for admixture with compositions containing glyphosate- and/or glufosinate for combating weeds, said additive comprising at least one surfactant in an amount of 4-58% by weight being emulsified, suspended and/or dissolved in a liquid, aqueous phase, and at least one undissolved, fine-grained, not biologically active, viscosity regulating filler, said filler acting to prevent the separation of the surfactant and being present in an amount of at least 0.3% by weight, characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of at least 5% by weight.

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File: USPT

Sep 12, 2000

DOCUMENT-IDENTIFIER: US 6117820 A

TITLE: Agrochemical formulation

Abstract Text (1):

An aqueous agrochemical concentrate formulation comprises a) an agrochemical electrolyte such as salts of glyphosate, fomesafen, glufosinate, paraquat or bentazone, b) an alkoxyated adjuvant, c) an alkylglycoside and d) a co-surfactant which interacts with the alkylglycoside to form a structured aqueous system. Preferred co-surfactants are:- (i) a linear or branched chain aliphatic or aromatic alcohol, (ii) an alcohol or ester or alkyl phenol alkoxyate having a degree of alkoxylation lower than that of the alkoxyated adjuvant present in the formulation as component (b), (iii) a glyceryl alkyl or alkenyl ester and (iv) a sorbitan alkyl or alkenyl ester. The alkyl glycoside and the co-surfactant interact to provide a structured aqueous system such that if the critical concentrations are exceeded and one or more components (normally the alkoxyated adjuvant) can no longer be maintained in a single-phase aqueous system, the second phase forms a stable dispersion (normally a liquid phase dispersion) which is supported within the structured aqueous system.

Brief Summary Text (3):

One widely used and highly effective class of adjuvants is that obtained by alkoxylation of a nonionic or cationic substrate. For example, Wyrtil and Burnside (Weed Science 1977 Vol 25 275-287) have shown that ethoxyated alcohols, esters and amines can be used to improve the biological performance of glyphosate. Particular problems can arise when alkoxyated adjuvants are combined with agrochemical electrolytes since all surfactants of the alkoxyate type undergo phase separation at a particular electrolyte concentration and temperature. One solution to this problem is to add a co-surfactant, solubiliser or hydrotrope that raises the cloud point of the alkoxyate, i.e., increases the electrolyte concentration or the temperature at which the phase separation occurs. Some success can be achieved in this area, for example, by adding a cationic surfactant to an alcohol ethoxyate, the alcohol ethoxyate can be formulated at a higher electrolyte concentration than would otherwise be possible. However this approach is of limited success in some instances, for example when high concentrations of the agrochemical electrolyte and the alkoxyate are required or if the formulation is required to be stable over a broad temperature range. Above a certain concentration of agrochemical electrolyte, unstable formulations would be produced at all practical temperatures.

Brief Summary Text (8):c) an alkylglycosideBrief Summary Text (9):d) a co-surfactant which interacts with the alkylglycoside to form a structured aqueous system.Brief Summary Text (10):

While the scope of the present invention is not limited by any one particular theory as to the function of the components of the formulation, it is believed that the components, (and in particular the alkyl glycoside and the co-surfactant) interact to provide a structured aqueous system. Thus even if the critical concentrations are exceeded such that one or more components (normally the alkoxyated adjuvant) can no longer be maintained in a single-phase aqueous system, the second phase forms a

stable dispersion (normally a liquid phase dispersion) which is supported within the structured aqueous system. Thus in contrast to prior art systems in which attempts have been made to overcome separation problems by adding still further "solubilising" components to maintain a single phase system, it is not essential that the formulation of the present invention is maintained as a single phase system. It is believed that the present invention provides a structured aqueous system, even in the presence of a second dispersed phase, such that a substantially homogeneous dispersion gives a uniform concentration in respect of all the components within the formulation.

Brief Summary Text (11):

As examples of the co-surfactant which interacts with the alkylglycoside to form a structured aqueous system there may be mentioned compounds having a hydrophobic group in combination with a relatively small hydrophilic group for example:

Brief Summary Text (23):

The agrochemical electrolyte may be an active agrochemical or an agrochemical enhancer such as ammonium sulphate or any other ionic species added to an agrochemical formulation. Suitable agrochemical actives which are agrochemical electrolytes are glyphosate (N-phosphonomethylglycine), which is commonly used in the form of its water-soluble salts such as trimethylsulphonium, isopropylamine, sodium, or ammonium salts, fomesafen which is commonly used in the form of its water-soluble sodium salt, glufosinate which is commonly used in the form of its water-soluble ammonium salt, paraquat dichloride and bentazone which is commonly used in the form of its water-soluble sodium salt. The use of an agrochemical enhancer or other additive which is itself an electrolyte may still further enhance the ionic strength of the composition, thereby increasing the potential stability problems. Thus, for example, glyphosate salts are commonly formulated or tank-mixed with ammonium sulphate as an activity enhancer, while magnesium sulphate may be added to paraquat as a purgative as disclosed for example in EP 0467529.

Brief Summary Text (30):

The alkylglycoside for use in the present invention may be obtained by the reaction of alkanols with glucose or other mono- or di- or polysaccharides. As used herein the term "alkylglycoside" includes an alkylmonoglycoside and an alkylpolyglycoside. Preferred alkylglycosides for use in the present invention are alkylglucosides obtained by the reaction of glucose with a straight or branched chain alkanol or mixture of alkanols, for example a mixture of alkanols containing 7 to 18, preferably 7 to 16 carbon atoms, for example 8 to 10 carbon atoms. The number of glucose groups per alkyl group in the molecule may vary and alkyl mono- or di- or polyglucose or saccharide derivatives are possible. Commercial alkylpolyglucosides usually contain a mixture of derivatives having an average number of glucose groups per alkyl group. Thus alkylglycosides have the general formula (I) ##STR1## wherein n is the degree of polymerisation and is typically within the range from 1 to 3, for example from 1 to 2, and R.sup.5 is a branched or straight chain alkyl group having from 4 to 18 carbon atoms or a mixture of alkyl groups having an average value within the given range. Typical of alkylglycosides is the product commercially available under the trade names AL2042 (Imperial Chemical Industries PLC) and AGRIMUL PG2067 (Henkel Corp) wherein n is an average of 1.7 and R.sup.5 is a mixture of octyl (45%) and decyl (55%), the product commercially available under the trade name AGRIMUL PG2069 (Henkel Corp) wherein n is an average of 1.6 and R.sup.5 is a mixture of nonyl (20%), decyl (40%) and undecyl (40%) and the product commercially available under the trade name BEROL AG6202 (Akzo Nobel) which is 2-ethyl-1-hexylglycoside.

Brief Summary Text (31):

As indicated previously, the agrochemical formulations of the present invention are preferably stable at relatively high ambient temperatures. It has been found that enhanced high temperature stability may be obtained by the inclusion of a minor proportion of an ionic surfactant (component e) which is different from the ethoxylated adjuvant (component b). It is believed that the presence of a minor proportion of an ionic surfactant in the formulation increases the amount of structuring that occurs, particularly at high temperatures. The addition of an ionic surfactant therefore offers another advantage, in that lower concentrations of the alkylglycoside and co-surfactant (d) can be used to produce stable formulations.

Brief Summary Text (34):

Thus, for example, when the agrochemical electrolyte is glyphosate and is used with a non-ionic ethoxylated adjuvant as component (b), especially preferred additional surfactants (component e) are cationic surfactants such as ethoxylated amines and optionally ethoxylated quaternary ammonium salts. Examples of suitable additional cationic surfactants include hexadecyl trimethyl ammonium chloride, coco trimethyl ammonium chloride and N-methyl cocoammonium chloride having a mean ethylene oxide content of 2.

Brief Summary Text (35):

As noted above, the advantages of the formulation of the present invention are fully realized at high concentrations of the agrochemical electrolyte and the alkoxyated adjuvant such that, in the absence of the co-surfactant which interacts with the alkylglycoside to form a structured aqueous system (component d), one or more component (usually the alkoxyated adjuvant) undergoes inhomogeneous phase separation, thereby destroying the homogeneity of the concentration of the components within the formulation. In particular, the concentration of the agrochemical electrolyte may be at the higher end of that found in practice for formulations of the agrochemical electrolyte. Such typical concentrations will be known to those skilled in the art or may be determined by routine experimentation in respect of the agrochemical electrolyte concerned.

Brief Summary Text (36):

The agrochemical glyphosate is especially suitable for formulation according to the present invention. Thus for example the present invention provides formulations of glyphosate wherein the concentration of glyphosate salt (expressed as glyphosate acid) is greater than 240 g/l and more particularly greater than 300 g/l, for example about 330 g/l or more. The formulation of the present invention may contain both relatively high concentrations of glyphosate salt up to about 330 g/l or more glyphosate salt (expressed as glyphosate acid) and up to about 120 g/l or more of alkoxyated adjuvant.

Brief Summary Text (37):

The proportion of alkoxyated adjuvant in the formulation of the invention is preferably from 8 parts by weight alkoxyated adjuvant per 1 part by weight alkyl glycoside to 1 part by weight alkoxyated adjuvant per 8 parts by weight alkylglycoside, for example 5 parts by weight alkoxyated adjuvant per 1 part by weight alkyl glycoside to 1 part by weight alkoxyated adjuvant per 8 parts by weight alkylglycoside and most preferably from 1 part by weight alkoxyated adjuvant per 0.5 parts by weight alkylglycoside to 1 part by weight alkoxyated adjuvant to 8 parts by weight alkylglycoside. An especially preferred composition contains about equal proportions by weight of alkylglycoside and alkoxyated adjuvant.

Brief Summary Text (38):

The co-surfactant (component d) present in the formulation is preferably from 0.1 parts by weight to 1 part by weight per 1 part by weight of alkylglycoside and most preferably from 0.2 parts by weight to 0.8 parts by weight of co-surfactant per 1 part by weight of alkylglycoside.

Brief Summary Text (39):

The proportion of additional ionic surfactant (component e) is preferably from 0 to 1 part by weight per 1 part by weight alkylglycoside and most preferably from 0.1 parts by weight to 0.3 parts by weight ionic surfactant per 1 part alkylglycoside.

Brief Summary Text (42):

Compositions of the present invention provide adjuvant enhancement for the active agrochemical concerned or increase the effectiveness of the adjuvant if the agrochemical electrolyte is an agrochemical enhancer such as ammonium sulphate. Thus formulations of the invention wherein the agrochemical electrolyte is a herbicide, and in particular when the herbicide is glyphosate, are active against a broad range of weed species including monocotyledonous and dicotyledonous species.

Brief Summary Text (46):

We have found that the development of a structured aqueous phase and a homogeneous

Brief Summary Text (48) :

Detailed Description Text (3):

Detailed Description Text (12):

Detailed Description Text (18):

Detailed Description Paragraph Table (1):

*AGRIMUL PG2067 is a 70% w/w solution of alkylpolyglycoside of formula (I above wherein n is an average of 1.7 and R.sup.5 is a mixture of octyl (45%) and decyl (55%). AGRIMUL is a trademark of Henkel. SYNPERONIC A16 is a blend of the ethoxylated alcohol SYNPERONIC A11 which has a mean ethylene oxide content of 11 with SYNPERONIC A20 (which has a mean ethylene oxide content of 20) in the ratio 3 to 2. SYNPERONIC is a trademark of Imperial Chemical Industries. ARQUAD 1629 is a 29% by weight solution of hexadecyl trimethyl ammonium chloride in water. ARQUAD is a trademark of Akzo Nobel. ETHOMEEN T25 is an ethoxylated tallowamine having 15 moles of ethylene oxide per mole of tallowamine. ETHOMEEN is a trademark of Akzo Nobel.

Detailed Description Paragraph Table (2):

Example 5 Example 6

*ARQUAD C35 is a 35% by weight solution of cocotrimethylammonium chloride in water.

Example 7 Example 8

*RHODASURF TR/15 is a polyoxyethylene
ethoxylation of 15. RHODASURF is a trademark
of Rhone Poulenc.

Example 9 Example 10

*ETHOQUAD C12 is a 75% by weight solution in 2propanol of ethoxylated coc methyl ammonium chloride having a degree of ethoxylation of 2. ETHOQUAD is a trademark of Akzo Nobel. MERGITAL LM17 is an ethoxylated C.sub.12 -C.sub.16 alcohol having a mean degree of ethoxylation of 17. MERGITAL is a trademark of Sidobre Sinnova. MERGITAL LM11 is ethoxylated C.sub.12 -C.sub.16 alcohol having a mean degree of ethoxylation of 11.

Example 11 Example 12

*SYNPERONIC L2 is an ethoxylated lauryl alcohol having a mean degree of ethoxylation of 2. TERGITOL 15S-9 is an ethoxylated secondary alcohol having a mean degree of ethoxylation of 9. TERGITOL is a trademark of Union Carbide.

Example 13 Example 14

*SURFYNOL 465 is an ethoxylated acetylenic diol with a mean degree of ethoxylation of 10. SURFYNOL is a trademark of Air Products. SYNPERONIC PE P85 is a block copolymer of ethylene oxide and propylene oxide with a molecular weight of 4650 and containing 50 weight % ethylene oxide.

Example 15 Example 16

Detailed Description Paragraph Table (9):

Example 17

150 g/l SYNPERONIC A16	120 g/l Octanol	Glyphosate trimesium 480 g/l AGRIMUL PG2067
		75 g/l Water to 1 liter

Detailed Description Paragraph Table (10):

	Example 18	Example 19
	Glyphosate	trimesium 480 g/l Glyphosate
trimesium 480 g/l AGRIMUL PG2067 110 g/l	AGRIMUL PG2067 110 g/l	SYNPERONIC A11 110 g/l
g/l SYNPERONIC A11 110 g/l ARQUAD 16-29 69 g/l	ARQUAD 16-29 69 g/l	Pentanol 60 g/l
Oleyl alcohol 60 g/l Water to 1 liter	Water to 1 liter	
	Example 20	Example 21
	Glyphosate	trimesium 480 g/l Glyphosate
trimesium 480 g/l AGRIMUL PG2067 110 g/l	AGRIMUL PG2067 110 g/l	SILWET L77 30 g/l
TWEEN 20 60 g/l ARQUAD 16-29 69 g/l	ARQUAD 16-29 69 g/l	2-ethylhexanol 60 g/l
2-ethylhexanol 60 g/l Water to 1 liter	Water to 1 liter	
	Example 22	Example 23
	Glyphosate	trimesium 480 g/l Glyphosate
trimesium 480 g/l AGRIMUL PG2067 110 g/l	BEROL AG6202 100 g/l	SYNPERONIC NP13 60 g/l
SYNPERONIC A11 100 g/l ARQUAD 16-29 69 g/l	ETHOMEEN C12 40 g/l	2-ethylhexanol 60 g/l
Decanol 40 g/l Water to 1 liter	Water to 1 liter	
	Example 24	Example 25
	Glyphosate	trimesium 480 g/l Glyphosate
trimesium 480 g/l AGRIMUL PG2069 150 g/l	AL2042 129 g/l	SYNPERONIC A11 80 g/l
SYNPERONIC A16 120 g/l ETHOQUAD C12 27 g/l	Octanol 60 g/l	Decanol 60 g/l
liter Water to 1 liter		

Detailed Description Paragraph Table (12):

	Example 27	Example 28
	Glyphosate	trimesium 480 g/l Glyphosate
trimesium 480 g/l AGRIMUL PG2067 110 g/l	AGRIMUL PG2067 110 g/l	SYNPERONIC A11 110 g/l
g/l SYNPERONIC A11 110 g/l ARQUAD 16-29 69 g/l	ARQUAD 16-29 69 g/l	SYNPERONIC OP3 60 g/l
g/l SPAN 20 50 g/l Water to 1 liter	Water to 1 liter	

CLAIMS:

1. An aqueous agrochemical concentrate formulation comprising

a) an agrochemical electrolyte,

b) an alkoxyated adjuvant,

c) an alkylglycoside, and

d) a co-surfactant which interacts with the alkylglycoside to form a structured aqueous system,

wherein the co-surfactant (d) is

i) a linear or branched chain aliphatic or aromatic alcohol, or

ii) an alcohol or ester or alkyl phenol alkoxyate which is an alkoxyated C.sub.8 -C.sub.22 alcohol, an alkoxyated C.sub.8 -C.sub.22 alkyl phenol or an alkoxyated C.sub.8 -C.sub.22 carboxylic acid each containing from 1-3 alkoxy groups provided that the alkoxyated adjuvant (b) contains from 6 to 50 C.sub.1 -C.sub.4 alkoxy groups, or

iii) a glyceryl alkyl or alkenyl ester,

provided that the concentration of the agrochemical electrolyte is such that the alkoxyated adjuvant would normally undergo unacceptable phase separation in the absence of the co-surfactant which interacts with the alkylglycoside to form a structured aqueous system.

4. A concentrate according to claim 1 wherein the agrochemical electrolyte is selected from salts of glyphosate, fomesafen, glufosinate, paraquat and bentazone.

8. A concentrate according to claim 7 wherein the proportion of additional ionic

surfactant is from 0 parts by weight to 1 parts by weight ionic surfactant per 1 part alkylglycoside.

9. A concentrate according to claim 7 wherein the proportion by weight of the total of the alkylglycoside, alkoxyated adjuvant and additional ionic surfactant, if used, to the agrochemical electrolyte is from 2:1 to 1:5.

10. A concentrate according to claim 1 wherein the proportion of the alkoxyated adjuvant is from 8 parts by weight alkoxyated adjuvant per 1 part by weight alkyl glycoside to 1 part by weight alkoxyated adjuvant per 8 parts by weight alkylglycoside.

11. A concentrate according to claim 1 wherein the proportion of the co-surfactant is preferably from 0.1 parts by weight to 1 part by weight per 1 part by weight of alkylglycoside.

13. A process for the preparation of a composition according to claim 7 wherein the agrochemical electrolyte, the alkylglycoside and the alkoxyated adjuvant are dissolved or dispersed in water with the further ionic surfactant, if used, and thereafter the co-surfactant is added and interacts with the alkylglycoside to form a structured system.

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L4: Entry 3 of 4

File: USPT

Aug 18, 1998

DOCUMENT-IDENTIFIER: US 5795847 A

TITLE: Herbicide preparation, a process for producing it and an activating additive for application therewith

Abstract Text (1):

Stable, concentrated herbicide preparation comprising at least one herbicide with at least one amino group, at least one carboxylic acid group and at least one phosphor containing acid group suspended in finegrained form in a liquid phase, and at least 5% by weight of a dissolved electrolyte; a process for producing said herbicide preparation and an activating additive (adjuvant) for combination with said herbicide preparation. Preferred suspensions comprise the herbicides glyphosate and glufosinate and the electrolyte ammonium sulphate, acting synergistically. It has not hitherto been possible to incorporate high concentrations of synergistic electrolytes in liquid concentrates of said herbicides.

Brief Summary Text (6):

In published european patent application EP 388.239 A1 pesticide suspensions are described, in which a certain amount of electrolytes is desirable. The suspension of finely ground pesticides in a concentration from 10-70% by weight in aqueous, structured systems of surfactants is described. The following pesticides are mentioned explicitly: ethofumesate, phenmedipham, dazomet, mancozeb, methylene bithiocyanate, amitraz and triforine. None of these pesticides contains both an acid and an amino group. The wording "structured systems of surfactants" is intended to mean aqueous systems, in which the surfactants form mesophases comprising structures larger than conventional spherical micelles and mutually interacting to form thixotropy in the aqueous medium. The structure comprises multilayers of spherulites or lamellae dispersed or emulsified as rods or discs in an outer aqueous phase, the size being normally 0.5-20 .mu.m. In the 14 examples of the application the not surface active electrolytes are present in an amount of 1.2-6.4% by weight of the total composition. It is a characteristic feature of this system, that the surfactant and the electrolyte must be adapted to each other as regards composition and amount to obtain the desired, stable structure.

Brief Summary Text (9):

It is well known that ammonium sulphate acts synergistically on the biological effect of glyphosate and glufosinate. For instance the patent literature contains many examples of combinations of glyphosate and ammonium sulphate, and in practice the farmer usually adds supplementary ammonium sulphate when diluting the glyphosate for use.

Brief Summary Text (10):

Danish patent application no. 2348/88 describe liquid, aqueous solutions of glyphosate with ethoxylated monoamines as surfactants. The possibility of dissolving additional ammonium sulphate exists, but this will lead to a lowering of the dissolvable quantity of glyphosate. Therefore, the maximum amount of glyphosate in a solution containing 280 g/l ammonium sulphate is approximately 120 g/l.

Brief Summary Text (11):

UK patent application GB 2.233.229 A describes a similar system, the ethoxylated monoamines being replaced by ethoxylated diamines. The typical, aqueous solutions contain 200 g/l ammonium sulphate and 75 g/l of glyphosate as its isopropylammonium salt.

Brief Summary Text (12):

UK patent application GB 2.245.170 A claims solutions of glyphosate containing ethoxylated phosphate esters as surfactants. In the examples, where ammonium sulphate has been added supplementary to the formulation in amounts of 200-300 g/l, the glyphosate constitutes 75 g/l corresponding to 100 g/l of the isopropylammonium salt.

Brief Summary Text (13):

In European patent application EP 441.764 A1 is mentioned, that alkoxylated, quaternary ammonium compounds especially coethoxylated-propoxylated quaternary ammonium compounds, is environmentally more acceptable and less skin and eye irritating than ethoxylated fatty amines. It is stated, that aqueous solutions of glyphosate in combinations with said surfactants also can contain ammonium sulphate, but no examples with such formulations are given. On the other hand two solid compositions containing ammonium sulphate are described.

Brief Summary Text (14):

In European patent application EP 498.785 A1 glyphosate formulations are mentioned, which contain esters of sorbitol and fatty acids as surfactants in combination with another surfactant. It is mentioned, that these formulations whether aqueous solutions or solid, finely distributed formulations may also contain ammonium sulphate or other inorganic ammonium salts. The system, however, seems to be best suited for solid formulations.

Brief Summary Text (15):

European patent application EP 498.145 A1 describes solid compositions containing glyphosate as free acid or salt, an inorganic ammonium salt (preferably ammonium sulphate) and alkylglycoside or alkylpolyglycoside as surfactant.

Brief Summary Text (16):

European patent application EP 448.538 A1 describes combinations of glyphosate and oxyfluorfen in solid formulations, additionally containing ammonium sulphate and other inorganic compounds.

Brief Summary Text (17):

International patent application WO 92/12637 deals with solid, preferably extruded or granulated formulations containing glyphosate in combination with alkaline compounds. A reaction takes place between the glyphosate and the alkaline compound either during the production process or during the subsequent mixing with the diluent water to totally or partly neutralize the glyphosate as salt whereby it dissolves easier and more quickly. The formulations shown besides comprise surfactants and frequently ammonium sulphate.

Brief Summary Text (18):

In danish patent application no. 6490/89 solid formulations of glyphosate in acid form containing a saturated C.sub.16-18 -fatty alcohol, being ethoxylated with approximately 25 moles ethyleneoxide are described. The formulations may additionally contain supplementary ammonium sulphate.

Brief Summary Text (20):

European patent application 243.872 A1 discloses pesticide preparations, comprising inter alia glyphosate dispersed in an oil containing, liquid phase. The addition to the formulations of ammonium sulphate is not mentioned.

Brief Summary Text (21):

French patent application 2.661.315 discloses the suspension of glyphosate and derivatives thereof in an organic solvent. The organic solvent might be water miscible, and it is mentioned that up to 50% of the solvent may be replaced by water. Furthermore the composition may comprise ammonium sulphate, which is characterized as an adjuvant. The form of the ammonium sulphate of the composition is not apparent from the description, but in the 5 examples of the application, the ammonium sulphate together with the glyphosate compound seems to be totally suspended or dissolved only to a limited extent in the liquid phase.

Brief Summary Text (22):

International patent application WO 92/21686 describes the production of trimethylsulfonium salt of glyphosate for instance by the reaction of glyphosate trimethylsulfonium hydrogen sulphate with an alkaline compound like ammonia. The application does not mention herbicidal suspensions in relation to the present invention. No description is found, neither in the patent description nor in the examples, of significant amounts of glyphosate being at any time suspended in an electrolyte solution and certainly not in a stable form. The principles of the present invention for formulating glyphosate, seem never to have been considered.

Brief Summary Text (23):

Many of the examples shown demonstrate the desirability of combining the herbicides glyphosate or glufosinate with ammonium sulphate and selected surfactants in one and the same formulation. Advantageously the formulation is as concentrated as possible.

Brief Summary Text (24):

As far as liquid, dissolved formulations are concerned, the ammonium sulphate has a salting-out effect on the dissolved salts of glyphosate and glufosinate, as well as on the dissolved surfactants, and an upper limit exists of the concentration of the solution dependent on the actual surfactant. Environmental requirements on the detergents, for instance as to biodegradability, poor toxicity towards fishes and low skin and eye irritation may reduce still further the number of relevant wetting agents. Besides, the various surfactants differ significantly in their promotion of the biological effect of glyphosate and glufosinate.

Brief Summary Text (25):

Therefore, the trend in recent developments is towards solid, finely dispersed and non-dusty formulations. Although the solubility of ammonium sulphate in water is big, the speed of dissolution of ordinary, commercial, crystalline ammonium sulphate in water in practice is hardly acceptable. Consequently, the crystalline ammonium sulphate frequently needs to be grinded before being mixed with glyphosate or glufosinate or preferably a salt thereof, the selected surfactant(s) and additive(s) being subsequently added. Amongst the additives adhesives, absorbing fillers or anticaking agents should be mentioned, which are necessary to obtain a finely dispersed, non-caking and easily flowing, solid formulation of adequate storage stability. For these processes an expensive formulation equipment is necessary.

Brief Summary Text (35):

Herbicides with at least one primary, secondary and/or tertiary amino group, at least one carboxylic acid group and at least one phosphor containing acid group normally have a relatively high solubility in water: about 0.1% corresponding to 1000 ppm or more, preferably at least 0.4% corresponding to 4000 ppm; by way of example the solubility of glyphosate is approximately 1% by weight in pure water at 20.degree. C.

Brief Summary Text (38):

The fact, that the grinding can take place without viscosity problems, even when no surfactant is added, is probably an essential condition for realising the invention. Even if a surfactant were added, the salting out from the electrolyte of the compound would generally be so extensive, that the wetting effect of the insignificant amount still dissolved in the water phase would be too small to influence significantly on the grinding. The surfactant, however, is still desirable. As mentioned above said surfactant is necessary to ensure the optimum, biological effect of the formulation, and it might contribute to the stabilization of the final formulation, i.e. ensure that the formulation remains homogenous and does not separate. Apparently the finely grinded, suspended herbicide and the added, finely distributed surfactant mutually interact to produce a mixture of an advantageous pseudoplastic or thixotropic character. Accordingly, it is possible to produce stable formulations comprising as the sole components water with dissolved electrolyte, suspended glyphosate and surfactant. It is even possible to produce stable suspensions using no surfactants at all.

Brief Summary Text (45):

d) In suspension preparations the amount of suspended solid material in a liquid

phase must be below a certain upper limit. Normally the practical limit is about 500 g/l suspension. In glyphosate preparations containing ammonium sulphate the desired content of ammonium sulphate as well as that of glyphosate is high, and this is not possible to obtain if both compounds are to be suspended when the ammonium sulphate is dissolved in the water phase and the glyphosate only is dispersed herein, it is possible to increase the amounts of ammonium sulphate as well as glyphosate.

Detailed Description Text (5):

Specially preferred herbicides are glyphosate (N-(phosphonomethyl)-glycine), glufosinate (4-(hydroxy (methyl) phosphinoyl)-DL-homoalanine), bilanafos (4-hydroxy(methyl)phosphinoyl)-L-homoalanyl-L-alanyl-L-alanin) and/or glyphosine (N,N-bis(p-hosphonomethyl)glycine), compare claim 4.

Detailed Description Text (12):

The invention also relates to stable, activating additives (adjuvants) on concentrated form, said adjuvants being active when admixed with glyphosate- and/or glufosinate preparations for combatting weeds, and said additives comprising at least one surfactant in an amount of 4-58% by weight, said surfactant being emulsified, suspended and/or dissolved in a liquid, aqueous phase; the composition of the adjuvant being further characterized by comprising at least one undissolved, fine-grained, not biologically active viscosity regulating filler acting to prevent separation of the surfactant, said viscosity regulating filler comprised in an amount of min. 0.3% by weight, and said liquid, aqueous phase being characterized by comprising an electrolyte, which is dissolved in the liquid, aqueous phase and, which is not a surfactant, in an amount of min. 5%.

Detailed Description Text (13):

Such a stable, activating additive is in a way an intermediate for the production of a concentrated suspension of glyphosate and/or glufosinate according to the invention, since the herbicide suspension can be produced from the additive simply by admixing finely grinded herbicide.

Detailed Description Text (14):

To produce the herbicidal solution/suspension for use, the farmer may make use of the additive, too. He just has to mix it with a glyphosate- or a glufosinate preparation. The form of the herbicide is of minor importance in this connection, for instance a finely grinded powder, a solid granulate, a solution in an appropriate solvent or even a suspension may be used.

Detailed Description Text (26):

Preferred herbicidal compositions are such, in which the selected herbicide is glyphosate or glufosinate, and the selected electrolyte is ammonium sulphate.

Detailed Description Text (36):

Specially preferred non-ionic surfactants are alkylglycosides, alkylpolyglycosides, alkoxyatedalkylglycosides, alkoxyated alkylpolyglycosides, alkoxyated saccharides, alkoxyated polysaccharides, alkoxyated acetylene diols containing a symmetrically substituted triple bond and ethoxyated polymethylsiloxanes, compare claim 13.

Detailed Description Text (43):

It is possible to adjust the suspension to enable most surfactants to physically enter it. The suspended herbicide helps preventing the surfactant from separating out. The surfactant is generally present in the suspension in a non-structured form. Therefore in most of the described herbicide suspensions comprising a surfactant, the surfactant will separate as an independent, liquid phase or as solid particles in case the suspended herbicide and solid additives, if any, are removed from the suspensions.

Detailed Description Text (44):

The present invention does not relate to the final dilutions made at the user level. The invention relates to concentrates only, being herbicide preparations or activating additives, which according to the invention are formulated in a new and more advantageous way. Since dilutions of use, made from the concentrates to a certain extent are well known, because they can be obtained by separate addition of

ammonium sulphate to known products, and they are known to possess a particularly satisfying biological effect, it seems redundant to prove the effect of the described compositions. There might be differences in the pH-values of the dilutions. For instance the pH-value of the herbicide preparations according to the invention is frequently low, because the glyphosate is preferably used in its non-neutralized form, but this fact is known to be of no biological importance. Reference is made in this connection to Danish patent application 6490/89, specially dealing with glyphosate on non-neutralized form.

Detailed Description Text (61):

Specially preferred herbicide suspensions comprise glyphosate suspended in ammonium sulphate, said suspensions being produced by adding sulfuric acid to solutions of the ammonium salt of glyphosate or adding ammonia to a solution of the sulfuric acid salt of glyphosate, preferably while cooling and continuously stirring.

Detailed Description Text (66):

The amount of the herbicide, for instance glyphosate or glufosinate, constitutes 0.2-4 kg/ha, preferably 0.3-3 kg/ha, especially 0.5-2.2 kg/ha and specially 0.8-1.5 kg/ha, calculated on an active ingredient basis.

Detailed Description Text (69):

Experiments 1-5 (see table A) demonstrates the suspension of glyphosate in free, non-neutralized form in an aqueous solution of ammonium sulphate. Calculated on the aqueous solution the amount of ammonium sulphate is 40% in all 5 experiments corresponding to a saturation in water at approximately 0.degree. C. In all of the examples, ethoxylated fatty amines are used as surfactants.

Detailed Description Text (70):

For the manufacture of the compositions 1 and 2 the Genamine (the ethoxylated fatty amine) was initially dissolved in a part of the water, following which the pH was adjusted with concentrated sulfuric acid to pH=3.5. The rest of the water was then added and subsequently the ammonium sulphate was stirred in, leading to the precipitation of the chief of the Genamine. The mixture was transferred as quantitatively as possible to a mini-mill with a volume of maximally 50 ml from the company Eiger Engineering Ltd., Warrington, Cheshire, England, being filled with 1-2 mm zirconium oxide pearls. The mill was started immediately at its highest speed, and the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Attagel was added, and the grinding was continued for maximally 5 minutes.

Detailed Description Text (71):

For the manufacture of the compositions 3, 4 and 5, the ammonium sulphate was initially dissolved in the total amount of water, following which the concentrated sulfuric acid was added, and the solution was transferred to the mini-mill. The mill was started at its highest speed, following which the addition of glyphosate was started. After 5 minutes all glyphosate was added. The grinding was continued for further approximately 10 minutes. Genamin was added immediately followed by Attagel, and the grinding was continued for approximately 5 minutes.

Detailed Description Text (73):

Samples of the above compositions were stored in 100 ml glass bottles with screw caps for 1 to approximately 4 weeks before the beginning of the accelerated testing. It was initially evaluated, whether the sample had separated a clear aqueous phase, and whether the surfactant had separated out on its own. The results of all evaluations are listed in table A. Subsequently the sample was shaken. The viscosity was visually evaluated, and the average particle size of the grinded glyphosate particles was estimated microscopically at 256 x. (It is very difficult to use a particle sizer for so many samples, because the samples must be measured in concentrated salt solutions possibly further saturated with glyphosate, in order to ensure, that the samples are not dissolved in the water. It is also important that the concentrated salt solution does not contain undissolved impurities, which might disturb the measurements). It was also estimated, whether the added surfactants had separated out as oily drops. If so, the estimated size of the drops was noted. If no oily drops could be observed, a "n.d." (not detected) is stated in the table. It should be noted, that any microscopic airbubbles present may give rise to a false

positive result.

Detailed Description Text (85):

After this testing period both groups of samples were cooled to ambient temperature and evaluated as mentioned above. Supplementary the speed of dissolution was determined as follows: 1 ml suspension was pipetted off and placed in a 150 ml beaker containing 100 ml deionized water. The mixture was stirred on a magnetic stirrer of moderate speed using a 4 cm magnet so as to produce an approximately 1 cm deep vortex in the diluent water, and the period of time until no more undissolved glyphosate could be observed was measured in seconds. All observations are listed in table A.

Detailed Description Text (100):

Experiments 6-10, 11-15, 16-20, 21-25 and 26-29 in the tables B, C, D, E, and F describe glyphosate compositions comprising various surfactants in varying amounts. The ratio glyphosate/surfactant is about 2/1 corresponding to the usual ratio in most commercial products. The amount of finely distributed fillers varies from 0 to 2% by weight. In all of the experiments the amount of the electrolyte ammonium sulphate is varying from app. 20 to 27 by weight. The grinding is performed in a mini-mill as described for the samples 3-5 in table A, the sulfuric acid addition, however, being omitted.

Detailed Description Text (106):

Experiments 31-35, 36-40, 41-45 and 46-49 in the tables G, H, I and J relate to various glyphosate compositions. Experiments 31-33 (table G) relate to compositions with ammonium salts different from ammonium sulphate. Experiments 34 and 35 (table G) relates to compositions comprising herbicide only suspended in an electrolyte solution. Experiments 36-40 (table H) show the use of potassium thiocyanate, sodium bromide and ammonium acetate as electrolyte. In the experiments 36 and 37, one of the acid groups in glyphosate is transformed into the sodium salt. In experiment 38, a little amount only of glyphosate is transformed into the sodium salt. In experiments 39 and 40, one of the acid groups in glyphosate is transformed into its ammonium salt. The experiments 41-45 (table I) relate to compositions comprising viscosity regulating, hygroscopic compounds. These are glycerine, propylene glycol, polyethylene glycol and lactic acid. Obviously the addition of these to the aqueous phase caused no tendency to separation of undissolved electrolyte. Experiments 46 and 47 relate to compositions further comprising oil. Experiment 48 and 49 relate to compositions comprising herbicide suspended in an electrolyte solution and small amounts of a viscosity regulating filler, but no surfactant.

Detailed Description Text (111):

In the experiments 46 and 47, the oils apparently do not disperse onto the grinded glyphosate, unlike the surfactants. This conclusion is based partly on the microscopy and partly on the experiment 46, in which the sample, which had been stored at varying temperatures, at the end of the experiment had separated two upper, clear phases. This was not observed in experiment 47. In both samples, the oil was uniformly re-distributed in the compositions after shaking.

Detailed Description Text (128):

The product of example 60 has been produced by initially dissolving the ammonium sulphate in water (40% ammonium sulphate solution) followed by admixture of propylene glycol, leading to a precipitation of ammonium sulphate. The stirring on the mini-mill was started, and the glyphosate was added in the usual way followed by admixture of Genapol OX-130.

Detailed Description Text (130):

At normal temperatures an ammonium sulphate solution comprises approximately 40% ammonium sulphate. In experiment 61 20 g ammonium sulphate was dissolved in the water phase followed by addition of propylene glycol, causing a precipitation of ammonium sulphate. Another 20 g ammonium sulphate was finely grinded in a blender with a view to adding it slowly during grinding before the addition of glyphosate, before the addition of Genapol and after the addition of Genapol, respectively.

Detailed Description Text (134):

A preferred composition of glyphosate in electrolyte solution comprises the

169.1 g glyphosate

169.1 g glyphosate is dissolved in 266 g water and 80 g aqueous 25% w/w ammonia solution together with 159,4 g ammonium sulphate in a beaker and is transferred to another container under vigorous stirring.

TABLE A

Experiment no.	1	2	3	4	5
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Components						% Deionized water	41.6	41.1	41.0	41.0	40.8	Ammonium sulphate	27.8	27.4	27.4	27.4	27.2	Glyphosate,	98%	20.8	20.6	20.6	20.6	20.4	Genamin T 150 (1)	6.9	6.8	Genamin O 80 (2)	6.8	Genamin C 100 (3)	6.8	Genamin C 020 (4)	6.8	Sulfuric acid, 98% app.	1.5	app.	1.4	2.1	2.1	2.7	Attagel (5)	1.4	2.7	2.1	2.1	2.1	Total weight (g)	144	146	146	146	147	Density (g/ml)	1.30	1.29	1.28	1.28	1.25	Glyphosate (g/l)	270	266	264	264	255	Ammonium sulphate	361	353	351	351	340	(g/l)	Evaluation before storage Appearance	15% upp.	10% upp.	10% upp.	10% upp.	10% upp.	10% upp.	cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly plastic viscous viscous plastic Plastic Particle size (.mu.m) app.	10	app.	10	5-10	app.	10	5-10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Evaluation after storage at various temperatures Appearance	30% upp.	20% upp.	15% upp.	25% upp.	25% upp.	cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity easily suffici-	suffici-	easily	easily	ently	ently	Particle size (.mu.m) app.	10	10-15	app.	10	10-15	5-10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	4	6	3	3	2	Evaluation after storage 14 days at 55.degree. C. Appearance	15% upp.	5% upp.	10% upp.	10% inner	15% upp.	cl. phase cl. phase cl. phase cl. phase cl. phase Viscosity pseudo- slightly plastic viscous viscous plastic Plastic Particle size (.mu.m) app.	10	10-15	app.	10	10-15	app.	10	10-15	app.	10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	3	4	4	2	7
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TABLE B

Experiment no.	6	7	8	9	10
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Experiment No. 5 / 5 / 5										Component						
Composition in % Deionized water										40.5	40.5	40.5	40.5	40.5	Ammonium sulphate	27.0
27.0	27.0	27.0	27.0	27.0	Glyphosate, 98%	20.3	20.3	20.3	20.3	20.3	Ethoquad C/25 (6)	10.2				
Emcol CC 55 (7)	10.2	Ampholyt SKKP-70 (8)	10.2	Synperonic NP-10 (9)	10.2	Tween 20 (10)	10.2	Attagel (5)	2.0	2.0	2.0	2.0				
2.0	2.0	2.0	2.0	2.0	Total weight (g)	148	148	148	148	148						
Density (g/ml)	1.28	1.27	1.27	1.27	1.27	Glyphosate (g/l)	260	258	258	258	258					
Ammonium sulphate	346	343	343	343	343	(g/l)	Evaluation before storage									
se-	no se-	15% lower	15% lower	10% lower	paration	cl.	phase	cl.	phase	cl.	phase	cl.				
viscous	viscosity	slightly	easily	slightly	slightly	slightly	viscous	viscous	viscous	viscous	viscous	viscous				
Particle size (.mu.m)	app.	10	app.	10	10-15	10-15	10	Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.				
25-100	Evaluation after storage at various temperatures						Appearance									
20% upp.	30% upp.	no se-	20% upp.	15% upp.	cl.	phase	cl.	phase	paration	cl.	phase	cl.				
cl.	phase	viscosity	easily	passende	passende	passende	viscous	viscous	viscous	viscous	viscous	viscous				
Particle size (.mu.m)	app.	5	app.	10	app.	10	app.	10	10-15	Oil drops (.mu.m)	n.d.	n.d.				
n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	2	2	3	3	2	Evaluation after storage 14 days						
at 55.degree. C.	Appearance	10% upp.	25% upp.	no se-	no se-	10% upp.	cl.	phase	cl.	phase	paration	paration				
plastic	plastic	viscosity	pseudo	easily	pseudo	slightly	pseudo	plastic	plastic	viscosity	plastic	plastic				
Particle size (.mu.m)	5-10	5-10	app.	10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15				
Oil drops (.mu.m)	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	4	1	3	7	2	2				

TABLE C

Experiment no.	11	12	13	14	15
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											Component
Composition in % Deionized water											40.5
40.5	40.5	40.5	40.5	40.5	40.5	Ammonium sulphate	27.0				
27.0	27.0	27.0	27.0	Glyphosate, 98%	20.3	20.3	20.3	20.3	20.3	Plantaren 225 (11)	
					10.2						

Plantaren 600 CS (12) 10.2 Berol 02 (13) 10.2 Berol 922 (14) 10.2 Pleuriol PE6400
 (15) 10.2 Attagel (5) 2.0 2.0 2.0 2.0 2.0 Total weight (g) 148 148 148 148 148
 Density (g/ml) 1.28 1.28 1.28 1.27 1.28 Glyphosate (g/l) 260 260 260 258 260 Amm.
 sulphate (g/l) 346 346 346 343 346 Evaluation before storage Appearance Foaming 15%
 lower no se- no se- 15% upp. 10% lower cl. phase paration paration cl. phase cl.
 phase Viscosity pseudo- suffici- clearly pseudo- pseudo- plastic ently pseudo-
 plastic plastic plastic Particle size (.mu.m) 10-15 app. 10 app. 10 app. 15 app. 15
 Oil drops (.mu.m) n.d. n.d. <25 25-100 >100 Evaluation after storage at various
 temperatures Appearance 5% inner 20% upp. 10% upp. 15% upp. 30% upp. cl. phase cl.
 phase cl. phase cl. phase cl. phase Viscosity suffici- suffici- suffici- easily
 easily ently ently ently Particle size (.mu.m) 10-15 10-15 5-10 app. 15 app. 15 Oil
 drops (.mu.m) n.d. n.d. n.d. n.d. n.d. Speed of dissol. (s) 46 12 2 6 2 Evaluation
 after storage 14 days at 55.degree. C. Appearance no se- 20% upp. no se- no se- no
 se- paration cl. phase paration paration paration Viscosity pseudo- suffici-
 viscous* pseudo- pseudo- plastic ently plastic plastic Particle size (.mu.m) 10-15
 10-15 5-10 app. 15 app. 15 Oil drops (.mu.m) n.d. n.d. n.d. n.d. n.d. Speed of
 dissol. (s) 25 14 23 6 4

*screw

cap leaky, crystals from the liquid observed.

Detailed Description Paragraph Table (4):

TABLE D

Experiment no. 16 17 18 19 20

Component

Composition in % Deionized water 40.5 40.8 40.8 40.5 40.5 Ammonium sulphate 27.0
 27.2 27.2 27.0 27.0 Glyphosate, 98% 20.3 20.4 20.4 20.3 20.3 Tween 85 (16) 10.2
 Ethoquad C/25 (6) 10.2 Arkopon T hockonc. (17) 10.2 Berol 987 (18) 10.2 Surfadon LP
 300 (19) 10.2 Aerosil R 972 (20) 1.4 Attagel (5) 2.0 1.4 2.0 2.0 Total weight (g)
 148 147 147 148 148 Density (g/ml) 1.26 1.26 1.28 1.27 1.26 Glyphosate (g/l) 256 257
 261 258 256 Amm. sulphate (g/l) 340 343 348 343 340 Evaluation before storage
 Appearance no se- no se- 10% lower no se- no se- paration paration cl. phase
 paration paration Viscosity slightly pseudo- pseudo- pseudo- pseudo- viscous plastic
 plastic plastic plastic Particle size (.mu.m) app. 10 10-15 app. 10 app. 10 app. 10
 Oil drops (.mu.m) 25-100 25-100 n.d. 25-100 <25 Evaluation after storage at various
 temperatures Appearance 10% upp. 30% upp. 15% lower no se- no se- cl. phase cl.
 phase cl. phase paration paration Viscosity suffici- pseudo- pseudo- pseudo- pseudo-
 ently plastic plastic plastic plastic Particle size (.mu.m) 5-10 app. 10 app. 10
 app. 10 app. 10 Oil drops (.mu.m) n.d. n.d. n.d. <25 n.d. Speed of dissol. (s) 3 3
 14 2 13 Evaluation after storage 14 days at 55.degree. C. Appearance no se- 10% upp.
 no se- no se- no se- paration cl. phase paration paration paration Viscosity
 slightly pseudo- slightly pseudo- some viscous plastic viscous plastic viscous
 Particle size (.mu.m) 5-10 10-15 5-10 10-15 5-10 Oil drops (.mu.m) n.d. n.d. n.d.
 25-100 n.d. Speed of dissol. (s) 5 2 19 4 20

Detailed Description Paragraph Table (5):

TABLE E

Experiment no. 21 22 23 24 25

Component

Composition in % Deionized water 40.5 41.4 40.0 38.7 38.2 Ammonium sulphate 27.0
 27.6 26.7 25.8 25.5 Glyphosate, 98% 20.3 20.7 20.0 19.4 19.1 Berol OX 45-11 (21)
 10.2 10.3 13.3 16.1 15.9 Attagel (5) 2.0 1.3 Total weight (g) 148 145 150 155 157
 Density (g/ml) 1.26 1.26 1.26 1.25 1.25 Glyphosate (g/l) 256 261 252 243 239
 Ammonium sulphate 340 348 337 323 319 (g/l) Evaluation before storage Appearance no
 se- 15% lower 15% lower 15% lower 10% lower paration cl. phase cl. phase cl. phase
 cl. phase Viscosity pseudo- easily easily easily slightly plastic viscous Particle
 size (.mu.m) app. 15 10-15 app. 15 10-15 app. 10 Oil drops (.mu.m) <25 25-100 <25
 25-100 25-100 Evaluation after storage at various temperatures Appearance 5% upp.
 35% upp. 30% inner 20% lower 5% inner cl. phase cl. phase cl. phase cl. phase cl.
 phase Viscosity clearly very ea- easily suffici- pseudo- pseudo- sily ently plastic
 plastic plastic Particle size (.mu.m) 10-15 10-15 10-15 10-15 app. 10 Oil drops (.mu.m) <25
 n.d. n.d. n.d. n.d. Speed of dissol. (s) 3 2 2 2 3 Evaluation after storage 14 days
 at 55.degree. C. Appearance no se- 30% upp. 15% inner 15% lower 10% lower paration
 cl. phase cl. phase cl. phase cl. phase Viscosity clearly very ea- easily suffici-
 pseudo- pseudo- sily ently plastic plastic Particle size (.mu.m) 10-15 10-15 app. 15

10-15 10-15 Oil drops (.mu.m) <25 n.d. 25-100 n.d. 25-100 Speed of dissol. (s) 10 1
1 2 3

Detailed Description Paragraph Table (6):

TABLE F

Experiment no. 26 27 28 29 30

										Component
Composition in % Deionized water										27.2
27.0	27.3	20.3	27.0	Glyphosate, 98%	20.4	20.3	20.5	20.3	20.3	Marlipal 1618/25 (22)
10.2	Radiasurf 7417 (23)	10.2	Berol OX 45-11 (21)	10.3	10.2	Berol 533 (24)	10.2			
Aerosil R 972 (20)	1.0	Attagel (5)	1.4	2.0	2.0	2.1	Total weight (g)	147	148	146.5
148	148	Density (g/ml)	1.27	1.28	1.26	1.22	1.26	Glyphosate (g/l)	345	346
259	260	344	248	340	(g/l)	Evaluation before storage	Appearance	no	se-	no
se-	no	se-	no	se-	no	se-	no	se-	no	se-
Viscosity slightly	slightly	pseudo-	pseudo-	pseudo-	pseudo-	viscous	viscous	plastic	plastic	plastic
Particle size (.mu.m)	app.	15	app.	15	app.	10	app.	15	app.	15
(.mu.m)	n.d.	25-100	25-100	25-100	>25	Evaluation after storage at various				
temperatures	Appearance	10%	app.	15%	app.	30%	app.	30%	app.	15%
phase cl.	phase cl.	phase cl.	phase cl.	phase	Viscosity clearly	pseudo-	pseudo-	pseudo-		
suffici-	pseudo-	plastic	plastic	plastic	ently	plastic	Particle size (.mu.m)	10-15		
app.	10	app.	10	10-15	app.	10	Oil drops (.mu.un)	n.d.	n.d.	25-100
dissol. (s)	2	2	2	2	3	Evaluation after storage 14 days at 55.degree. C.	Appearance	no	se-	no
se-	no	se-	no	se-	20%	app.	no	se-	no	se-
Viscosity slightly	pseudo-	pseudo-	pseudo-	easily	viscous*	viscous	plastic	plastic	plastic	plastic
size (.mu.m)	10-15	app.	10	app.	10	app.	15	app.	10	Oil drops (.mu.m)
n.d.	n.d.	Speed of dissol. (s)	7	3	2	2	17			

*Screw

cap leaky, crystals from the liquid observed.

Detailed Description Paragraph Table (7):

TABLE G

Experiment no. 31 32 33 34 35

										Component
Composition in % Deionized water										27.4
17.0	Ammonium sulphate	17.0	24.6	22.1	Ammonium nitrate	27.0	Glyphosate, 98%	20.5		
20.4	20.3	38.5	44.8	Berol OX 45-11 (21)	10.3	10.2	10.2	Attagel (5)	0.7	1.4
146	147	148	130	145	Density (g/ml)	1.35	1.29	1.25	1.33	1.38
277	263	254	512	618	Electrolyte (g/l)	555	439	338	327	305
storage	Appearance	10%	lower	no	se-	no	se-	20%	app.	10%
paration cl.	phase cl.	phase cl.	phase	Viscosity easily	slightly	easily	passende	slightly		
viscous	viscous	viscous	Particle size (.mu.m)	app.	15	10-15	10-15	20-25	app.	20
drops (.mu.m)	25-100	25-100	25-100	n.d.	n.d.	Evaluation after storage at various				
temperatures	Appearance	25%	lower	10%	app.	30%	app.	30%	app.	20%
phase cl.	phase cl.	phase cl.	phase cl.	phase	Viscosity easily	pseudo-	easily	passende		
slightly	plastic	viscous	viscous	Particle size (.mu.m)	app.	15	10-15	10-15	25-30	
app.	20	Oil drops (.mu.m)	<25	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s)	2	3
Evaluation after storage 14 days at 55.degree. C.	Appearance	15%	lower	no	se-	30%	app.	30%	app.	15%
app.	30%	app.	15%	app.	cl.	phase	paration	cl.	phase	cl.
easily	pseudo-	easily	slightly	plastic	viscous	Particle size (.mu.m)	app.	15	10-15	app.
10-15	app.	15	app.	25	app.	20	Oil drops (.mu.m)	n.d.	n.d.	25-100
dissol. (s)	3	5	2	16	6					

Detailed Description Paragraph Table (8):

TABLE H

Experiment no. 36 37 38 39 40

										Component
Composition in % Deionized water										27.0
Ammonium sulfamate	40.5	39.5	Natrium bromide	29.7	Ammonium acetate	33.8	Glyphosate, 98%	20.3	Glyphosate Na-salt	20.3
45-11 (21)	10.2	9.9	10.1	9.2	Marlipal 1618/25 (22)	9.9	NaOH, 28%	1.4	Attagel (5)	2.0
1.3	0.7	1.8	1.3	Total weight (g)	148	152	148	163	152	Density (g/ml)
1.35	1.35	Glyphosate salt (g/l)	270	285	282	373	310	Electrolyte (g/l)	539	522
456	533	Evaluation before storage	Appearance	10%	lower	5%	lower	10%	inner	no
se-	cl.	phase	cl.	phase	cl.	phase	paration	paration	Viscosity	pseudo-
suffici-										

easily pseudo- clearly plastic ently plastic pseuplas. Particle size (.mu.m) app. 15
 10-15 10-15 30-50 app. 15 Oil drops (.mu.m) n.d. <25 n.d. n.d. 25-100 Evaluation
 after storage at various temperatures Appearance 10% lower 10% lower 25% upp. no se-
 10% lower cl. phase cl. phase cl. phase paration cl. phase Viscosity clearly
 suffici- easily clearly clearly pseuplas. ently pseuplas. pseuplas. Particle size
 (.mu.m) 20-25 app. 15 10-15 app. 50 app. 20 Oil drops (.mu.m) n.d. n.d. n.d.
 n.d. Speed of dissol. (s) 3 5 3 9 2 Evaluation after storage 14 days at 55.degree.
 C. Appearance 10% lower 10% lower 20% upp. no se- no se- cl. phase cl. phase cl.
 phase paration paration Viscosity clearly suffici- easily clearly clearly pseuplas.
 ently pseuplas. pseuplas. Particle size (.mu.m) 15-20 10-15 app. 15 30-50 app. 15
 Oil drops (.mu.m) n.d. n.d. n.d. <25 n.d. Speed of dissol. (s) 7 8 5 21 5

Detailed Description Paragraph Table (9):

TABLE I

Experiment no. 41 42 43 44 45

Experiment no.	41	42	43	44	45	Component
Composition in % Deionized water	38.0	38.0	13.6	38.0	22.1	Ammonium sulfamate 20.5
32.2 Ammonium sulphate	25.3	25.3	25.3	Glyphosate, 98%	19.0	19.0 20.6 19.0 25.0 Berol
OX 45-11 (21)	9.5	9.5	10.3	9.5	Glycerine 6.3	34.3 Propylene glycol 20.7 PEG E200
(27)	6.3	Lactic acid 6.3	Attagel (5)	1.9	1.9	0.7 1.9 Total weight (g) 158 158 146
158 140 Density (g/ml)	1.27	1.25	1.30	1.27	1.34	Glyphosate (g/l) 241 238 268 241 335
Electrolyt (g/l)	321	316	267	321	431	Evaluation before storage Appearance no se- no
se- no se- no se- 20% upp.	paration	paration	paration	paration	cl. phase	Viscosity
pseudo- pseudo- pseudo- clearly	easily	plastic	plastic	plastic	pseudo- plastic	
Particle size (.mu.m) app. 15	app. 10	app. 15	app. 15	app. 10	Oil drops (.mu.m)	
25-100 >100 n.d.	25-100 n.d.	Evaluation after storage at various temperatures				
Appearance no se- 10% upp.	10% lower	5% upp.	35% upp.	paration cl.	phase cl.	phase
cl. phase cl. phase	Viscosity pseudo-	pseudo-	pseudo-	clearly	easily	plastic plastic
plastic pseudo- plastic	Particle size (.mu.m)	10-15	app. 10	app. 15	app. 15	app. 10
Oil drops (.mu.m) n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	Speed of dissol. (s) 2 2 4 2 3
Evaluation after storage 14 days at 55.degree. C.	Appearance no se- no se- no se- 25%					
upp. paration paration paration paration cl.	phase	Viscosity clearly	pseudo- pseudo-			
clearly easily pseudo- plastic plastic	pseudo- plastic plastic	Particle size (.mu.m)	app. 15	app. 15	app. 10	Oil drops (.mu.m) n.d. n.d. n.d. n.d. n.d.
app. 15 5-10 app. 15 app. 15 app. 10						Speed of dissol. (s) 8 2 5 2 3

Detailed Description Paragraph Table (10):

TABLE J

Experiment no. 46 47 48 49

Experiment no.	46	47	48	49	Component
Composition in % Deionized water	38.0	38.0	40.5	57.6	Ammonium sulphate 25.3
25.3 27.0 14.3	Glyphosate, 98%	19.0	19.0		
30.5 25.2 Berol 02 (13)	6.3	6.3	Hydropar 19 (25)	9.5	Radia 7131 (26)
9.5 Attagel 1.9					
1.9 2.0 2.9 Total weight (g)	158	158	148	139	Density (g/ml) 1.22 1.21 1.34 1.22
Glyphosate (g/l)	232	230	409	174	Ammonium sulphate 309 306 362 307 (g/l)
Evaluation before storage Appearance 10% lower	15% lower	no se-	10% upp.	cl. phase cl. phase	
paration cl. phase Viscosity suffici-	suffici-	pseudo-	easily	ently	plastic
Particle size (.mu.m) app. 20 app. 15	10-15	20-25	Oil drops (.mu.m)	>100	25-100 n.d.
n.d. Evaluation after storage at various temperatures	Appearance 30% 2 30% lower	10%			
upp. 10% upp. upp. cl. cl. phase cl. phase cl.	phase phases	Viscosity suffici-			
pseudo- pseudo- easily	ently	plastic plastic	Particle size (.mu.m)	app. 15	10-15
10-15 20-25 Oil drops (.mu.m)	>100 >100	n.d. n.d.	Speed of dissol. (s)	2 2 2 22	
Evaluation after storage 14 days at 55.degree. C.	Appearance 15% lower	20% lower	no se-	no se-	cl. phase cl. phase
se- no se- cl. phase cl. phase paration paration	Viscosity suffici-	pseudo- pseudo-			
easily	ently	plastic plastic	Particle size (.mu.m)	app. 15	app. 15 10-15 20-25
Oil drops (.mu.m) >100 >100	n.d. n.d.	Speed of dissol. (s)	4 5 2 4		

Detailed Description Paragraph Table (11):

TABLE K

Experiment no. 50 51

Experiment no.	50	51	Component
Composition in % Deionized water	42.8	41.7	Ammonium sulphate 28.6
27.8 Moussex 904 SE (28)	0.7	Ethoquad C/25 (6)	25.0
Berol OX 45-11 (21)	27.8	Attagel 40 (5)	3.6
2.0 Total weight (g)	140	144	Density (g/ml) 1.15 1.14
Glyphosate (g/l) -- --	Ammonium sulphate 329	317 (g/l)	Evaluation before storage Appearance 10% lower
10% lower cl. phase cl. phase	Viscosity suffici-		

suffici- ently ently Particle size (.mu.m) -- -- Oil drops (.mu.m) >100 25-100
 Evaluation after storage at various temperatures Appearance 30% lower 25% lower cl.
 phase cl. phase Viscosity suffici- suffici- ently ently Particle size (.mu.m) -- --
 Oil drops (.mu.m) n.d. n.d. Evaluation after storage 14 days at 55.degree. C.
 Appearance 10% lower 5% lower cl. phase cl. phase Viscosity suffici- suffici- ently
 ently Particle size (.mu.m) -- -- Oil drops (.mu.m) n.d. n.d.

Detailed Description Paragraph Table (14):

TABLE N	Experiment no. 59 60 61 62				Component
Composition in g					Deionized water 60.0 30.0
30.0 Ammonium sulphate	40.0	20.0	40.0	40.0	Propylene glycol 30.0 30.0 60.0
Glyphosate, 98%	30.0	30.0	30.0	30.0	Genapol OX 130 (30) 20.0 20.0 20.0 20.0
Viscosity Brook-	1800	3100	--	--	field at 20.degree. C. mPaxs mPaxs

Other Reference Publication (1):

STN International, Chemical Abstracts, vol. 119, No. 9, 88928t "Herbicide
glyphosate salt concentrate", Aug. 30, 1993.

CLAIMS:

5. The herbicide composition according to claim 1, wherein the herbicide is
glyphosate (N-(phosphonomethyl)glycin), glufosinate
 (4-(hydroxy(methyl)phosphinoyl)-DL-homoalanin,
 bilanafos (4-hydroxy(methyl)-phosphinoyl)-L-homoalanyl-L-alanyl-L-alanin) and/or
 glyphosine (N,N-bis(phosphonomethyl)-glycin).

7. The herbicide composition according to claim 1, wherein the herbicide is
glyphosate, glufosinate, bilanafos and/or glyphosine in its free, non-neutralized
 form or completely or partly converted into its respective ammonium salt by reaction
 with ammonia.

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L4: Entry 4 of 4

File: EPAB

Mar 4, 1999

DOCUMENT-IDENTIFIER: WO 9909822 A1

TITLE: AGROCHEMICAL FORMULATION

Abstract (1):

CHG DATE=19990905 STATUS=O>An aqueous agrochemical concentrate formulation comprises a) an agrochemical electrolyte such as salts of glyphosate, fomesafen, glufosinate, paraquat or bentazone, b) an alkoxyated adjuvant, c) an alkylglycoside and d) a co-surfactant which interacts with the alkylglycoside to form a structured aqueous system. Preferred co-surfactants are: (i) a linear or branched chain aliphatic or aromatic alcohol, (ii) an alcohol or ester or alkyl phenol alkoxyate having a degree of alkoxylation lower than that of the alkoxyated adjuvant present in the formulation as component (b), (iii) a glyceryl alkyl or alkenyl ester and (iv) a sorbitan alkyl or alkenyl ester. The alkyl glycoside and the co-surfactant interact to provide a structured aqueous system such that if the critical concentrations are exceeded and one or more components (normally the alkoxyated adjuvant) can no longer be maintained in a single-phase aqueous system, the second phase forms a stable dispersion (normally a liquid phase dispersion) which is supported within the structured aqueous system.

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- ☐ 1. Document ID: JP 2002537312 W WO 200049873 A1 AU 200021201 A EP 1156716 A1

L6: Entry 1 of 1

File: DWPI

Nov 5, 2002

DERWENT-ACC-NO: 2000-565400

DERWENT-WEEK: 200304

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TITLE: Stable aqueous agrochemical concentrate for combining agrochemical electrolyte and water insoluble agrochemical, comprises alkyl-glycoside and cosurfactant to form structured aqueous system

INVENTOR: BEAN, M J; CUTLER, J L

PRIORITY-DATA: 1999GB-0004012 (February 22, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 2002537312 W	November 5, 2002		027	A01N025/30
WO 200049873 A1	August 31, 2000	E	024	A01N057/20
AU 200021201 A	September 14, 2000		000	A01N057/20
EP 1156716 A1	November 28, 2001	E	000	A01N057/20

INT-CL (IPC): A01 N 25/04; A01 N 25/30; A01 N 43/40; A01 N 47/30; A01 N 57/20

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	KVMC
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L6: Entry 1 of 1

File: DWPI

Nov 5, 2002

DERWENT-ACC-NO: 2000-565400

DERWENT-WEEK: 200304

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TITLE: Stable aqueous agrochemical concentrate for combining agrochemical electrolyte and water insoluble agrochemical, comprises alkyl-glycoside and cosurfactant to form structured aqueous system

INVENTOR: BEAN, M J; CUTLER, J L

PATENT-ASSIGNEE: ZENECA LTD (ZENE), SYNGENTA LTD (SYGN)

PRIORITY-DATA: 1999GB-0004012 (February 22, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 2002537312 W	November 5, 2002		027	A01N025/30
WO 200049873 A1	August 31, 2000	E	024	A01N057/20
AU 200021201 A	September 14, 2000		000	A01N057/20
EP 1156716 A1	November 28, 2001	E	000	A01N057/20

DESIGNATED-STATES: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP2002537312W	January 28, 2000	2000JP-0600493	
JP2002537312W	January 28, 2000	2000WO-GB00249	
JP2002537312W		WO 200049873	Based on
WO 200049873A1	January 28, 2000	2000WO-GB00249	
AU 200021201A	January 28, 2000	2000AU-0021201	
AU 200021201A		WO 200049873	Based on
EP 1156716A1	January 28, 2000	2000EP-0901245	
EP 1156716A1	January 28, 2000	2000WO-GB00249	
EP 1156716A1		WO 200049873	Based on

INT-CL (IPC): A01 N 25/04; A01 N 25/30; A01 N 43/40; A01 N 47/30; A01 N 57/20

ABSTRACTED-PUB-NO: WO 200049873A

BASIC-ABSTRACT:

NOVELTY - Aqueous agrochemical concentrate formulation (I) comprises:

- (a) an agrochemical electrolyte;
- (b) a water-insoluble agrochemical system;
- (c) an alkylglycoside; and
- (d) a co-surfactant which interacts with the alkylglycoside to form a structured aqueous system.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for preparation of the formulation comprising admixing components (a)-(c) as above and an ionic surfactant, then adding component (d).

USE - (I) provides a convenient means of mixing high concentrations (up to 330 g/l of electrolyte and 500 g/l of water-insoluble system) agrochemical agents with different physical properties into a single concentrate which only requires dilution before use. (I) is preferably employed for the formulation of herbicides for killing or severely damaging unwanted plants.

ADVANTAGE - (I) provides a formulation which permits the combination of water soluble and water-insoluble agrochemicals which overcomes the sedimentation problems on storage associated with prior-art clay stabilized systems. The agrochemical electrolyte may be an agrochemical enhancer. The combination reduces mixing and handling of potentially toxic chemicals and the storage volume of the ingredients.

ABSTRACTED-PUB-NO: WO 200049873A
EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.0/0

DERWENT-CLASS: C03

CPI-CODES: C05-B01G; C05-C01; C06-F03; C07-A02A; C07-D04A; C07-D12; C07-D13;
C10-A08; C10-A13D; C10-A22; C10-E04; C10-E04C; C14-V01;